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IN THE

Supreme Court of the United States

OCTOBER TERM, 1934.

No. 221

UNITED STATES OF AMERICA, ET AL.,
Appellants,

vs.

THE BALTIMORE AND OHIO RAILROAD COMPANY, ET AL.,
Appellees.

APPELLEES' BRIEF.

R. V. FLETCHER,
SIDNEY S. ALDERMAN,
JACOB ARONSON,
H. Z. MAXWELL,
CLARENCE A. MILLER,
ALFRED P. THOM, JR.,
NYE F. MOREHOUSE,
Attorneys for Appellees.

December 10, 1934.

THE GUNTHORP-WARREN PRINTING COMPANY, 310 WEST JACKSON, CHICAGO

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APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF OHIO, EASTERN DIVISION.

APPELLEES' BRIEF.

STATEMENT OF THE CASE.

This case is here on direct appeal from a specially constituted District Court. (R. 71-2.) Twenty railroads (R. 1) on their own behalf and as representatives of more than 670 other railroads similarly situated (R. 4, 28-38, 43-50) petitioned below for an injunction against the Interstate Commerce Commission's order in the so-called *Power Reverse Gear case*,[1] which would require these railroads to

1. *A. Johnston, et al.* v. *A. C. L. R. R. Co., et al.*, 190 I. C. C. 351. (R. 50-62.)

install power reverse gears on more than 17,500 of their locomotives in active service and to install steam connections to all power reverse gears now in use.

Upon final hearing the District Court entered a decree setting aside the order in question and permanently enjoining the enforcement thereof. (R. 223-4.) The decree of injunction was based upon specific findings of arbitrary action on the part of the Commission—

(1) In failing to give consideration and legal effect to pertinent, substantial and uncontradicted facts before it having an important and controlling bearing upon the issues;

(2) In reaching conclusions and making its order contrary to and in disregard of the undisputed evidence before it; and

(3) Because the order was unsupported by the evidence. (R. 218-24.)

Other grounds urged by appellees for vacating the Commission's order were rejected, but are again urged in this court.[2] (R. 6-11, Petition, Par. VII, IX; R. 11-12, Petition, Par. X; R. 21-2, Petition, Par. XIV.)

The questions here for determination are:

(1) Whether or not the Commission acted in excess of the authority granted to it by Congress in the Act commonly known as the Boiler Inspection Act;[3]

(2) Whether or not the Commission's order is void because unsupported by essential findings of fact;

(3) Whether or not the Commission acted arbitrarily in any of the several respects found by the District Court; and

(4) Whether or not that part of the order which would require installation of steam connections on existing power reverse gear equipped engines violates the "due process" clause of Amendment XIV.

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2. *Langnes* v. *Green*, 282 U. S. 531, 535-9.

3. The Act passed February 17, 1911 (36 Stat. 913), as amended March 4, 1915 (38 Stat. 1192), and June 7, 1924 (43 Stat. 659); 45 U. S. C. Sections 22 to 34, inclusive, pages 78-88. As enacted in 1911 this law applied only to locomotive boilers and their appurtenances. The amendment of 1915 extended the scope of the Act to include the entire locomotive and tender and all parts and appurtenances thereof. The amended Act is still commonly referred to as the Boiler Inspection Act.

1. Proceedings Before the Commission.

Stated briefly, appellants Johnston and Robertson (complainants before the appellant Commission) alleged and undertook to prove—

(1) That the manually operated reverse gear is *inherently unsafe and unsuitable in principle and design;* that any engine equipped with it is not susceptible of operation without unnecessary peril to life or limb; and that all locomotives so equipped have been and are being operated in violation of the Boiler Inspection Act; and

(2) That the power reverse gear is a suitable, safe and practical device, and any engine equipped with it may be operated in any service to which the same may be put without unnecessary peril to life or limb.

The prayer of the complaint was that the Commission—

(1) Command all the steam railroads in the country who were made defendants before Commission to cease and desist from operating all locomotives equipped with manually operated reverse gear; and

(2) "Make and prescribe appropriate rules and regulations" requiring all steam locomotives to be equipped "with power reverse gear, or other devices adequate to protect the employees upon said locomotives from unnecessary peril to life or limb, as provided in Section 2 of said Boiler Inspection Act, as amended." See complaint, III, IV and V. (R. 26-7.)

Thus the stated purpose of the complaint was protection of *"the employees upon said locomotives"* from alleged unnecessary danger to life or limb. The broader field of protection to employees other than those upon the locomotives and to travelers upon railroads was not encompassed within the prayer. Likewise, complainants' proof before the Commission showed injuries to *enginemen only,* which complainants attributed to the use of manually operated reverse gear. Other employees and travelers have received no injuries so attributable, in so far as the exhaustive investigation in this case shows.

Notwithstanding the inclusion of "other devices" in the prayer, the appellants have given no consideration or attention in this case to any devices or means other than power reverse gears which might remedy the alleged conditions complained of.

The answers filed on behalf of the railroads joined issue on the merits, as to manually operated reverse gears, alleged power reverse gears are still the subject of experimentation and change and are neither suitable, useful nor necessary for use on many locomotives; averred that the financial condition and ability of the carriers was such as to preclude, in the interests of employees, security holders, and the general public, the expenditure of funds for installation of power reverse gears; and questioned the Commission's right and authority to entertain the complaint, to proceed in any manner thereunder, or to grant any relief prayed for therein. (R. 28-9, 39-44.)

2. Action Taken by the Commission.

The Commission made no findings as to whether or not the locomotives complained of are being operated with unnecessary peril to life or limb because equipped with manually operated reverse gears; nor as to whether or not locomotives equipped with manually operated reverse gears were and are susceptible of operation without unnecessary peril to life or limb. (R. 60.) Its order purports to amend Rule No. 157, which was one of the set of rules under the amended Boiler Inspection Act prepared by the chief inspector, agreed to by the railroads and the railroad employees, and approved by the Commission by its order of October 11, 1915. As approved at that time Rule No. 157 read as follows:

> "157. *Reversing Gear*—Reversing gear, reverse levers, and quadrants shall be maintained in a safe and suitable condition for service. Reverse lever latch

shall be so arranged that it can be easily disengaged, and provided with a spring which will keep it firmly seated in quadrant. Proper counterbalance shall be provided for in the valve gear." (R. 61, 1295.)

The order amends that rule by adding three paragraphs to it:

(a) Requiring new locomotives to be equipped with power reverse gears;

(b) Requiring power reverse gears to be installed on existing locomotives weighing (on driving wheels) 150,000 pounds or more if used in road service and 130,000 pounds or more if used in yard service; and

(c) Requiring steam connections to be installed for use with all power reverse gears—both on engines already equipped with such gears and on those required by the order to be so equipped. (R. 8-9, 61-2.)

3. Comparison of Hand and Power Reverse Gears.

It is desirable to have in mind certain distinguishing features and characteristics of the two types of gears. Either type is used for the purpose of adjusting the position and movement of the locomotive valve gear and valves, thereby controlling the admission of steam to the locomotive cylinders and the direction of the locomotive's movement. (Petition V, R. 5; U. S. Answer II, R. 62; Report, R. 52, 378-9.)

The controlling device used by the engineer in operating either of these types of reversing gears may be either of the lever and quadrant type, or of the screw type on which a hand wheel fitted with a short handle is revolved by the engineer to obtain the required movement or adjustment of the gear.

(*a*) *Hand Reverse Gears.*

The manually operated reverse gear of the lever type is of quite simple design. It consists of a bar from 4 to 6 feet long (R. 238) pivoted on a fulcrum bolt on the locomotive frame below the floor of the cab and extending upward

through a slot in the floor, which slot extends lengthwise of the locomotive. Above this slot is the quadrant made of steel in the form of an arc with notches in the upper convex surface thereof. A steel dog or latch is fastened on the reverse lever so as to fit in the notches of the quadrant as the lever is moved forward or backward by the engineer. The latch is connected by a rod to a short latch-lifter handle attached near the upper end or handle of the reverse lever so that it may easily be compressed against the lever handle when grasped by the engineer with one hand. The latch is fitted with a spring which causes it to be pushed down into the notches of quadrant when the latch-lifter is released. This spring holds the latch in the quadrant notch, thereby maintaining the lever at any desired point. (R. 238, 701, 776, 1213, 1301.) The manual screw reverse gear likewise is a simple device and consists, in place of a hand bar and quadrant, of a small wheel with a handle attached by which the engineer revolves the wheel, which in turn operates a screw connected by means of a sliding block with the reach rod below described. Otherwise, the screw reverse gear operates as does the hand bar reverse. (R. 1376, 266.) More than 1,950 locomotives, constituting approximately 11 per cent of those affected by the Commission's order, are equipped with this type of gear.[4]

Attached to the lever below the quadrant (or the screw) is a reach rod extending forward along the boiler to the valve gear or mechanism that controls the adjustment of the valves which control the admission of steam to the cylinders of the locomotive. The combined weight of these parts which are moved in the operation of the manual reverse gear may run as high as 1,700 pounds, but most of them are simply rotated or moved angularly on lubricated bearings and therefore the force necessary to move them

4. Ex. 58 (R. 1501-35) shows 1,956 "screw" gears out of 17,525 manual gears on 134 railroads.

is comparatively small. (R. 1295-7.) In addition to the leverage provided by the lever itself, or the threads of the hand screw gear, the weight of any parts which are lifted or moved is entirely equalized by "counterbalance" springs, adjustable by the engineer to any desired tension. (R. 238-9, 249, 1298, 1222, 763, 378-9, 432-3, 465-6, 555, 570-1, 694, 594, 729, 828-9, 855-6, 859, 968, 997, 1305.) Furthermore, with Walscheart and Baker types of valve gears, in use on 78 per cent of the engines above the weights prescribed in the order (R. 1536), the parts lifted by the reversing gear weigh only about 60 pounds and the remaining parts are simply shifted, rotated or moved angularly on lubricated bearings. (R. 238-9, 1295-7, 1118.)*

The amount of force required to operate the reverse gear has no relation to the weight or size of the locomotive. (R. 700, 698, 828-9, 1118, 1295-1300.) It depends in the first instance upon the type, size and weight of the locomotive valves and valve gear, but in the final analysis depends entirely upon the leverage provided and the counterbalancing arrangements and the adjustment thereof. (R. 594, 828-9, 831, 968, 1118, 1212, 1222, 1296-7.) The difference in steam pressure carried on the different locomotives makes no difference with the modern type of valves—the so-called "piston valves." (R. 396, 698, 738, 1297, 810.) The trend in design of valve gear parts in recent years has been to make them lighter in weight, and in general the valve gear parts are no heavier on the medium weight and larger types of locomotives than on the smaller and more obsolete types. (R. 831, 1295-8.)

Numerous engineers, witnesses on both sides alike, testified that in actual operation of locomotives there is no substantial difference in the amount of strength required on large and on small engines, in the handling of manually

* With Stephenson gear the parts lifted are heavier but may be easily moved. (R. 465-6.)

operated reversing gear. (R. 255, 261, 277, 286, 323, 369-70, 649, 694, 698, 700, 810, 824, 828-9, 1118, 1152, 1179, 1300.) Similarly, much testimony shows the handling of the heavier classes of engines equipped with manually operated reversing gear without engineers experiencing any difficulty or strain in any way. (R. 482, 867, 871, 1365-6, 499, 500, 504, 649, 750-1, 754-5, 767, 775-6, 779, 800, 840, 843, 888, 1101, 1306.) The later and heavier locomotives are equipped with piston valves and handle fully as easily, or more easily, with manually operated reversing gear than the earlier and lighter engines equipped with the older type of slide valves. (R. 369-70, 396, 411, 482, 649, 698, 738, 752, 764-5, 786, 810, 824, 1252, 1275; Complainant's Exceptions, R. 74-5.) Also the more modern types of valve gears, viz.: Walscheart and Baker, on these heavier engines make them handle more easily than the older and lighter engines equipped with the less modern Stephenson valve gear. (R. 286, 370, 482, 831, 1118; Complainants' Exceptions, R. 74-77.) Manually operated reversing gear often handles as easily or more easily than power reverse gear. (R. 669, 744, 755, 933, 1093, 1095, 1101.)

(b) *Power Reverse Gears.*

A reference to the circulars and drawings (Ex. 3, 8, 9 and 15, Separate Volume of Exhibits) shows that all types of power reverse gears are constructed upon the principle of employing the force of compressed air to move the reversing gear in place of the muscular force used by the engineer in adjusting the reversing gear with the manually operated types. To accomplish this, a somewhat complicated mechanism has been developed, constructed about an air cylinder mounted on the side of the locomotive usually just below the running board outside of the cab and to the rear of the tumbling shaft. This cylinder encloses a piston head upon either side of which air pressure from the air

reservoir on the locomotive is supplied or exhausted through the use of an air valve attached to or connected with the cylinder. The operation of the air valve is in turn controlled by either a lever moving in a quadrant, or a wheel, within the cab, mounted similarly and designed for operation similar to the manually operated reverse levers and wheels, except that the quadrants, levers and wheels are smaller. (R. 755, 1281.) The entire power reverse mechanism consists of from 45 to 75 separate parts,[4a] many of which are hidden from view, whereas hand gears have few parts which are all readily open to inspection. (R. 1293, 1384, 880, 656.)

When these gears are in 100 per cent condition the piston head in the air reverse cylinder frequently moves back and forth a short distance without any movement of the control lever or wheel in the cab. (R. 1378-9.) This results in an undesired change in the point at which admission of steam to the cylinder is cut off. It is termed "creeping." (R. 58, 681.)

In case of any leakage of air occurring at this air cylinder, or the valve or other pipes or fittings (R. 739), a considerably greater and often more rapid movement of the power reverse piston occurs, due to an unequal pressure on the two sides of the piston head. This, too, is commonly called "creeping" (or "floating") (R. 681, 1144-7, 1133-5, 1172-3, 880-2, 1120, 898-9), and the more violent cases of creeping are called "pumping." (R. 483-5, 522-7, 540-1, 545-7, 558, 609.) Other variations of creeping are called "jumping" (R. 647, 767, 803, 1182-3, 1265), "lunging" (R. 674) and "shimmying" (R. 1248-9). All signify erratic performance.

From the above it is apparent that the comparison of any one of these several makes of power reverse gears with

4a. For further details as to power reverse gears see Appendix X, p. 168, *et seq.*

either type of manually operated reverse gear, involves the comparison of a rather complicated and quite delicately adjusted auxiliary motor or machine, with a simple tool. (R. 1212.) The difficulties of the railroads in endeavoring to maintain this auxiliary motor in air tight condition to avoid excessive "creeping" and otherwise in suitable shape for operation, have been many and the expense thereof considerable. The evidence from many different railroads covering the country from coast to coast leaves no room for doubt that these difficulties are inherent and still prevalent. (See discussion and evidence cited under finding 4 (g), pp. 73-5 hereof.)

Progress nevertheless has been made and is still being made in the development of the power reverse gear. Numerous slight changes in design have been made in the course of this development. (R. 1376-8.) Much experimentation is still taking place and the device still leaves much to be desired in actual performance. (R. 614-5, 656-9, 665, 676-8, 718, 744-5, 889, 896, 969, 1116, 1194, 1198-1200, 1214-5, 1217, 1230, 1264-5, 1283, 1302-3, 1307, 881-4, 1169-73, 1542-44, Ex. 60-5, R. 1193-4, 1544-47, Ex. 66-67.) In the matter of overcoming creeping little progress has been made. (R. 1214-5, 1248-9, 1253, 1276-7, 1307, 493, 540-1, 659, 675, 711, 743, 745, 758, 840, 847, 881-2, 939, 1120-2, 1151.)

4. Cost of Installations Required by the Order.

The American Railway Association representing approximately 440 railroads joined as defendants before the Commission (R. 28-39) introduced Exhibit 92 (R. 1562) showing for 157 out of 177 Class I railroads a total of 56,968 steam locomotives, of which 27,568 were equipped with power reverse gears and 29,400 were equipped with manually operated reverse gears, and further showing the average estimated cost of applying power reverse gears to

these manually reversed engines to be $411.68 per locomotive. Exhibit 58 (R. 1501-36) later furnished by the American Railway Association at the request of the Examiner shows the weights on the drivers, etc., of each class of locomotives. The total number of locomotives shown on this exhibit which would have to be equipped with power reverse gears in order to comply with the Commission's order is 17,525.[5] Using the average cost figure of $411.68 produces a total cost considerably in excess of $7,000,000, and it is apparent that this does not include all engines which would be affected by the order.

Paragraph (c) of the order as amended would require existing locomotives already equipped with power reverse gears to be provided with steam connections. There are more than 27,500 locomotives already equipped with power reverse gears, all of which would be affected by this paragraph of the order. The record does not show how many of these already have steam connections nor is the average cost of applying steam connections shown, but it is apparent this requirement of the order would add substantially to the cost of compliance.

A considerable expenditure of funds on the part of certain Short Line Railways is also involved. (Ex. 41, separately printed.)

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5. The Commission's brief, p. 20, states 18,600 engines are within the specified weight limits. This larger figure is accounted for by the fact that reports from all Class I railroads are not included in Exhibit 58. The Commission's report states that "many of the locomotives in service with hand reverse gears will be dismantled before they are again given Class 3, or heavier repairs." (R. 59.) This statement is based upon information taken from the Commission's last previous annual report showing 9,840 locomotives "stored in serviceable condition and 6,442 others out of service undergoing or awaiting repairs." (R. 59.) Even if these statistics, which are not of record in this case, were proper to be considered, they would not support the Commission's conclusion, for they do not show how many, if any, of those engines were equipped with manually operated reverse gears.

Furthermore the fact of so many engines being stored in serviceable condition and so many more awaiting repairs, proves nothing as to when any of those engines will ultimately be junked and retired from service. Our figure of 17,525 includes only those affirmatively shown as affected by the order, and is less than the actual number which the Class I railroads would have to equip.

The District Court found:

> "Said order will require substitution of power operated for hand operated gears on over 17,000 locomotives, at an ultimate expense upon the carriers of approximately seven million dollars in making such changes and applying certain emergency steam connections in connection therewith and to locomotives already equipped with power reverse gears." (Finding 3, R. 219.)

5. Financial Condition of Railroads.

The railroads introduced evidence before the Commission showing the very drastic decline in their traffic, income, and net earnings during the year 1930, and the first seven months of 1931. (R. 1310-14, 1566; Exs. 96, 97 and 98.) The continued and further drastic decline was well known to the Commission at the time of making and amending its order herein during the early months of 1933. In its Forty-sixth Annual Report to Congress, on December 1, 1932, the Commission said in part at pages 6-8, that:

> "The drastic decline in revenues and income in 1932 has intensified the seriousness of the condition of railway finances. The operating revenues of Class I railways for the first 9 months of 1932 were under those of the same period in 1931 by 27.91 per cent, of 1930 by 42.11 per cent, and of 1929 by 50.56 per cent." (pp. 6-8.)

As a result of this long continued decline in income and earnings, it is a matter of common knowledge that many railroads have been unable to earn sufficient money to pay their interest charges and other current obligations, and have been compelled to borrow huge sums of money from the United States Government to enable them to do so. A number of railroads have passed the point where they can borrow more, and have either gone into receivership or taken advantage of the amended Bankruptcy Law. Others are reaching that state. The financial requirements placed

upon the carriers by this order are unfortunately and disastrously burdensome at this time. This situation was brought to the Commission's attention in brief and argument before Division 6 (R. 128-9, 141, 143-5) and in the petition for reargument before the whole Commission filed February 11, 1933. (R. 202.) That this general situation still persists without abatement is a matter of common knowledge and is attested by the appointment of Trustees in bankruptcy proceedings for three of the Appellees herein since the filing of this case in the District Court eighteen months ago.

Supplementing the general showing of railroads as a whole, there was presented to the Commission evidence respecting certain typical individual lines showing how the greatly reduced revenues have made necessary drastic reductions in expenditures for all purposes and imposed in the operating and mechanical departments the absolute necessity for careful and painstaking conservation of available funds in order that existing equipment and facilities may be maintained in condition for safe operation in the interests of all employees and the public. The effect of this depression in reducing employment and in curtailing the making of locomotive repairs is definitely shown. (R. 1250-1, 1255-7, 1217-20, 687-90, Exs. 29-34, R. 1489-91, 685-7, 1233-35, Exs. 69-72, R. 1549-51.)

The plain purport of this testimony was aptly stated by the General Mechanical Superintendent of the New York, New Haven & Hartford Railroad, who said:

> "To divert any part of available funds to applying power reverse gears would impair rather than promote safety." (R. 1256.)

No attempt was made by the complainants to controvert these facts. In his proposed report the Examiner who heard the evidence said:

> "While defendants urge that the carriers generally

> are in such financial condition that they should not be required to make the expenditure necessary to apply power reverse gears, we think *the question of financial ability to apply the requested equipment cannot, as a matter of law, properly have any bearing upon the decision of the Commission* in this case. Any other view leads to the conclusion that the provisions of existing law, and evidence, mean one thing at one time and something else at another time. There has probably never been a time when some carriers subject to this law were not in as difficult financial condition as carriers generally are at present." (R. 194. Italics ours.)

In their exceptions to the Examiner's proposed report complainants were contending the proposed order should require power reverse gears on all locomotives. Therein they said that the Examiner "very soundly points out * * * 'the question of financial ability to apply the requested equipment cannot, as a matter of law, properly have any bearing upon the decision of the Commission in this case.' " (R. 80.)

The Commission adopted the proposed report on the whole without substantial change. But in so doing it retained only the first clause above quoted, so that the report of the Commission reads:

> "Defendants urge that the carriers generally are in such financial condition that they should not be required to make the expenditure necessary to apply power reverse gears." (R. 59.)

It retained, however, certain further observations of the Examiner to the effect that whatever expense was imposed by the order would be distributed "among a large number of carriers and spread over a period of approximately four years" (R. 59) and stated:

> "We cannot believe the present financial condition will be permanent." (R. 60.)

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ARGUMENT.

I.

THE COMMISSION'S LACK OF AUTHORITY.

1. THE BOILER INSPECTION ACT CONFERS NO SUCH POWERS AS ASSUMED BY THE COMMISSION IN THIS CASE.

In their petition in the District Court appellees set out with particularity the basis of their objections to the Commission's unwarranted and unlawful assumption of power (R. 10-11), referring in that behalf to their amended and supplemental answers before the Commission. (R. 6-7.)

The Boiler Inspection Act consists of nine sections, and is of itself an independent and complete piece of legislation.

In section 5, the making of an original code or set of rules and instructions *for each individual carrier* was provided for, the requirement being that each carrier should itself prepare and file these rules and instructions within three months after the approval of the act. In order to take care of the contingency of any one or more carriers failing to do so, the act further provided that, in such event, at the expiration of three months the chief inspector should prepare and file rules and instructions to be observed by such carriers. In either case, *i. e.*, whether prepared by the individual carriers or by the chief inspector, such rules and instructions were required to be submitted to the Commission *for approval.*

Section 5 contains an equally specific provision for the making of changes in these rules, reading as follows:

> "Provided also, That *such common carriers* may from time to time change the rules and regulations herein provided for, but such change shall not take effect and the new rules and regulations be in force until the same shall have been filed with and approved

by the Interstate Commerce Commission." (Italics ours.)

This is the only provision of the law dealing with subsequent changes in the rules. The order of the Commission, here under review, which decrees changes in the rules, either finds statutory authority in this section of the Act, or stands confessed as utterly lacking any statutory authority.

It is the position of the appellees that this proviso in unambiguous language specifies how changes in the rules may be made; that neither this proviso nor any other provision of Section 5 gives the Commission power or authority to initiate such changes, its authority in the matter being expressly limited to approval of such changes as shall have been filed with it.

Section 5 is, of course, only one section of this act, and the act should be read as a whole. When this is done, nothing will be found in any way conflicting with or qualifying the proviso above quoted. In fact, the remaining provisions harmonize with Section 5. This is shown by provisions for a chief inspector, 2 assistants and 65 district inspectors, skilled men with practical knowledge of the construction and operation of locomotives (Secs. 3 and 4), making it the duty of each district inspector to *become familiar*, so far as practicable, *with the condition of each locomotive in his district;* to make personal inspection thereof from time to time as necessary to carry out the provisions of the act; to see that *the carriers themselves make inspections* as required by the rules of the act, *and that they repair all defects* disclosed by such inspections before again placing locomotives in service (Sec. 6). The Act further provides that whenever a district inspector shall find any locomotive not conforming to the requirements of the law or the rules "established and approved as hereinbefore stated" he shall notify the carrier "that the locomotive is not in serviceable

condition" and that it shall not be used "until in serviceable condition." Provision is made for an appeal from the decision of the district inspector to the chief inspector, and if the district inspector is upheld, the carrier may within thirty days appeal to the Commission "and upon such appeal, and after hearing, said Commission shall have power to revise, modify, or set aside such action of the chief inspector and declare that said locomotive is in serviceable condition and authorize the same to be operated." (Sec. 6.)

The position of the appellees is confirmed by an examination of the legislative history of the Boiler Inspection Act, which clearly shows that Congress intended the Commission to have no power whatsoever with respect to initiating subsequent changes in the rules. On January 23, 1911, Mr. Mann, chairman of the House Committee on interstate and foreign commerce, submitted to the House of Representatives Report No. 1974. In that report the several bills and substitute bills which had been before the Congress at divers times beginning in 1909 were reviewed and these various bills are set forth at length in the report.[6] On the question of making changes or modifications in the rules, we find there was included in one of these bills (S. 6702) a provision as follows (Sec. 3):

> "*Interstate Commerce Commission* is hereby *given power* * * * *to make, alter, amend and enforce* all needful rules and regulations for testing boilers of locomotives and their appurtenances used by carriers subject to this act * *." (Italics ours.) (p. 7, H. R. Report No. 1974, 61st Cong. 3rd Session; 45 Cong. Rec. 2243.)

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6. The propriety of reference to congressional committee reports to aid in determining the legislative intent is well established. *Duplex Co. v. Deering*, 254 U. S. 443, 474-5. This is usually done, however, only in cases where the statute is ambiguous or obscure. Appellees here point to the House Report for the purpose of showing that the plain and unambiguous language of the Act was adopted by Congress deliberately and intentionally.

Another proposal, known as the Mann Bill, contained the following provision:

> "Interstate Commerce Commission *may*, after hearing, at any time, *modify, change* and *revise*" rules filed by carriers and "*may establish new rules and regulations* * *." (Italics ours.) (p. 15, H. R. Report No. 1974, 61st Cong., 3rd Session.)

Neither of these proposals, however, was enacted by Congress. They were rejected in favor of the law in its present form which, as has been pointed out, specifically provides that *the carriers* may from time to time make changes in the rules subject to the Commission's approval. This very definitely shows that Congress intentionally refrained from giving the Commission any power to initiate cnanges in the rules, and purposely left the matter of initiating changes entirely with the carriers.[7]

For convenient reference, there is appended at the end of this brief a table which shows the provisions with reference to the making and changing of rules as they appeared in the successive bills reviewed in that Congressional Report.

In attempting to convert this plainly expressed permissive right of the carriers into a compulsory requirement enforceable by the Commission, appellants refer to the title

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7. Some cogent reasons for so doing are suggested in *Baltimore & Ohio R. R. Co.* v. *Groeger*, 266 U. S. 521, 530-31, in which it is said:

"There is a multitude of mechanical questions involved in determining the proper construction, maintenance and use of the boilers, other parts of locomotives, their tenders and appurtenances, all of which are covered by the Boiler Inspection Act, as amended. Inventions are occurring frequently, and there are many devices to accomplish the same purpose. Comparative merits as to safety or utility are most difficult to determine. It is not for the courts to lay down rules which will operate to restrict the carriers in their choice of mechanical means by which their locomotives, boilers, engine tenders, and appurtenances are to be kept in proper condition. Nor are such matters to be left to the varying and uncertain opinions and verdicts of juries. The interests of the carriers will best be served by having and keeping their locomotive boilers safe; and it may well be left to their officers and engineers to decide the engineering questions involved in determining whether to use fusible plugs or other means to that end."

of the Boiler Inspection Act and emphasize the words therein to the effect that it is an act to promote the safety of employees and travelers upon railroads, by *compelling* common carriers to equip their locomotives with safe and suitable boilers, etc. They argue that in view of this language used in the title of the act it is absurd to suppose that Congress meant exactly what it said in Section 5 with respect to the matter of making changes in the rules from time to time. In support of this argument they cite *Johnson* v. *Southern Pacific Co.*, 196 U. S. 1, 14, and *Southern Ry.* v. *Crockett*, 234 U. S. 725, 735. In the former case this Court held that the Safety Appliance Act of 1893 requiring "any car used in moving interstate traffic" to be equipped with automatic couplers applied to locomotives because the word "car" was manifestly used in a generic sense. It was said: "Tested by context, subject matter and object, 'any car' meant all kinds of cars running on the rails, including locomotives." (196 U. S. at pp. 13-16.) The latter case held the 1903 amendment making the previous Safety Appliance Acts apply "to all trains, locomotives," etc., brought the requirement regarding height of drawbars to bear upon locomotives. In so holding, the opinion referred to the Commission's report recommending this amendment to Congress, thus confirming the intent of Congress as expressed in the plain language of the act. (234 U. S. at p. 734-6.) It is for the same purpose that we here refer to H. R. Report No. 1974, making plain the intent of Congress that the unambiguous terms of the proviso of Section 5 shall prevail. *Wood* v. *Broom*, 287 U. S. 1, 7-8; *United States* v. *Mo. Pac. R. Co.*, 278 U. S. 269, 277-9. General words in the title may not be used for the purpose of changing specific language in the body of an act shown by the legislative record to have been deliberately adopted.

Moreover, a consideration of the act as a whole, discloses the incongruity for which appellants argue to be fanciful

rather than real. They say it is absurd to suppose Congress intentionally left the initiation of changes of the rules in the hands of the carriers, because the Commission would then have no way of *compelling* the carriers to equip their locomotives as expressed in the title of the act. This overlooks the fact that the compulsion expressed in the title was carried out in the body of the act, wherein each carrier was required within ninety days to file its rules with the chief inspector and in case of failure so to file, the latter was empowered to prepare rules "to be observed by such carrier" which after approval by the Commission and service upon an official of the carrier "shall be obligatory, and a violation thereof punished as hereinafter provided." (See Sec. 5.) This is compulsion and in no uncertain terms, and abundantly satisfies the purpose expressed in the title.

The appellants argue that unless there be power in the Commission, on its own initiative, or on petition of parties other than the carrier involved, to order subsequent changes in type of equipment, a so-called "frozen" status results; and our position (which is that an exclusive grant to the carriers of initiative power to change the rules may not be construed as if it gave such power to the Commission, or others) is described as one which answers itself by its mere statement.

Although the Court is not judicially concerned with the wisdom of the procedural scheme embodied in the legislation, the fact remains that there are sound reasons why Congress should refrain from divesting the carriers of initial responsibility for the proposal of subsequent changes in the inspection rules based upon the requirement of new equipment. Some of these reasons are suggested in the opinion in *Baltimore & Ohio R. R. Co.* v. *Groeger*, hereinbefore quoted. Much may also be said for the proposition that best results are obtained if the officers of a particular

carrier, including its engineering and mechanical experts, who are charged with the responsibility of safe operation, should also be charged with the duty of designing and planning types of locomotive equipment. A division of responsibility might easily enough lead to unsatisfactory and unhappy eventualities. Then, also, there is to be borne in mind the fact that hundreds of millions of dollars are invested in locomotives, and much may be said against the propriety of divesting the carriers of the opportunity to continue to use such locomotives during the full period of the reasonable usefulness thereof. Indeed, it is not to be presumed that so drastic a power was conferred upon the Commission by inferential language. (See *Interstate Commerce Comm.* v. *Los Angeles,* 280 U. S. 52, 68-70; and *Interstate Commerce Comm.* v. *Oregon-Washington R. Co.,* 288 U. S. 14, 35.) The statute, as written, abundantly protects all safety aspects, in that by Section 2 thereof it is made unlawful for any carrier to use a locomotive unless "in proper condition and safe to operate • • • without unnecessary peril to life or limb," and by Section 6 it is made the duty of the district inspectors to make personal inspections of the locomotives under their care and to exclude from service any "not in serviceable condition". It is noteworthy that in the procedure here followed by the Commission not only do we find lack of jurisdiction in the respects already pointed out but, as well, it is found that the entire governmental inspection service, technically qualified, set up by the statute, including the chief inspector appointed by the President and not subject to the control of the Commission, is altogether ignored.

The brief of the appellants seems to proceed upon what we think is the fallacious theory that, unless we are able *de novo* to establish a procedural *rationale,* as convenient or satisfactory to the interveners as the procedure here adopted by the Commission, then by process of elimination

it must be concluded that the power which was exercised was intended to be conferred; and from this, that the secondary conclusion should follow that the power having been intended to be conferred, it will be concluded that it was conferred even in the absence of provision to that effect.

The applicable principle of law is that the power of the Commission is limited to that vested in it by Congress and that any attempted exercise in excess of the power so delegated is void. (*Interstate Commerce Comm.* v. *C. N. O. & T. P. Ry. Co.*, 167 U. S. 479, 510; *Harriman* v. *Interstate Commerce Comm.*, 211 U. S. 407; *Southern Pacific Co.* v. *Interstate Commerce Comm.*, 219 U. S. 433; *United States* v. *L. & N. R. R. Co.*, 236 U. S. 318; *United States* v. *Pennsylvania R. R. Co.*, 242 U. S. 208; *Interstate Commerce Comm.* v. *Los Angeles*, 280 U. S. 52, 68-9.)

The Commission's brief almost entirely ignores this well-settled rule of law, because nowhere except at pages 46 and 47 of that brief do we find any attempt to identify or localize in the statute a vesting of the power that was here exercised. The reference there made is casual, undoubtedly necessarily so in view of its untenable basis. That reference is to the provision contained in the first clause of Section 5 of the Boiler Inspection Act, reproduced at page 102 of the brief. That clause is the one which provides the mechanics for the initial promulgation of the rules and specifies that each carrier shall file its inspection rules with the chief inspector within three months "after the approval of this Act, and after hearing and approval by the Interstate Commerce Commission, such rules and instructions, with such modifications as the Commission requires, shall become obligatory upon such carrier". It would hardly appear open to question that the modifications by the Commission, there contemplated, as there stated, have reference to the inspection rules filed within

three months "after the approval of" the Act. Indeed, all room for construction would appear dispelled in view of the specific provision farther on in the same section for changes in the rules "herein provided for," from time to time, by the carriers, with the supervising proviso that such changes shall not become effective until filed with and approved by the Commission.

Although recognized as not conclusive, but nevertheless submitted as highly persuasive, is the circumstance that, in the enactment of the United States Code, the interpretation contended for by the appellants was not adopted but, on the contrary, the codifiers recognized that the initial inspection rules had long since been adopted and for that reason deleted the introductory matter originally contained in the section. United States Code, Title 45, section 28, reads as follows:

> §28. RULES AND INSTRUCTIONS AS TO INSPECTION. Rules and instructions for the inspection of locomotive boilers which have been made by a carrier subject to this chapter and approved by the Interstate Commerce Commission are obligatory on such carrier until changed in the manner hereafter provided, and a violation thereof shall be punished as provided in section 34. A carrier may from time to time change such rules and instructions, but such change shall not take effect and the new rules and instructions be in force until the same shall have been filed with and approved by the Interstate Commerce Commission. The chief inspector shall also make all needful rules, regulations, and instructions not inconsistent herewith for the conduct of his office and for the government of the district inspectors: *Provided, however,* That all such rules and instructions shall be approved by the Interstate Commerce Commission before they take effect. (Feb. 17, 1911, c. 103, §5, 36 Stat. 914.)"

In the compilation made by the Interstate Commerce Commission pursuant to Senate Resolution No. 17, of December 6, 1927, of Federal Laws relating to the regulation of carriers, with digests of pertinent decisions, and printed

as Senate Document No. 166, 70th Congress, 1st Session, it will be found that the United States Code section just quoted is embodied as the current law. In this connection, it may be observed that the adjustment in language of section 5 of the Boiler Inspection Act, as above set forth, was not superficially adopted in oversight of the original language, because in a footnote is to be found the introductory text of the original act (see Interstate Commerce Acts Annotated, Vol. 4, p. 3299).

2. This Court's Decision in the Napier Case Does Not Warrant the Commission's Order Herein.

The report of the Commission makes no attempt to explain in what manner it believes the provisions of the Boiler Inspection Act confer upon it the power to initiate changes in the rules. After referring to the contentions of the railroads the report states, "We find no basis for such a view in the language of the Boiler Inspection Act or the decisions of courts relating thereto." (R. 52-3.)

Appellants attempt to justify the Commission's assumption of authority in this case by quotations from *Napier* v. *Atlantic Coast Line,* 272 U. S. 605. A reading of that opinion in full and a consideration of the question decided in that case will disclose that the question here raised was not there involved nor decided. The question before the Court in that case is stated in the opinion at page 607, as follows:

> "The main question, which is the same in the three cases, is one of statutory construction. It is whether the Boiler Inspection Act has occupied the field of regulating locomotive equipment used on a highway of interstate commerce, so as to preclude state legislation."

And at page 613 the holding of the Court is stated as follows:

> "We hold that state legislation is precluded, because

> the Boiler Inspection Act, as we construe it, was intended to occupy the field. The broad scope of the authority conferred upon the Commission leads to that conclusion. Because the standard set by the Commission must prevail, requirements by the States are precluded, however commendable or however different their purpose."

Following this holding, the opinion concludes by stating that

> "If the protection now afforded by the Commission's rules is deemed inadequate, application for relief must be made to it. The Commission's power is ample. Obviously, the rules to be prescribed for this purpose need not be uniform throughout the United States; or at all seasons; or for all classes of service,"

and it is upon this passage of the opinion that the appellants rely to cure the absence of any provision in the Boiler Inspection Act, granting power to the Commission to proceed in the first instance with the making of changes in the rules. They also rely upon a further passage in the opinion in the *Napier case* to the effect that the Commission has power, under the Boiler Act, by means of prescribing rules and regulations under the Act by which fitness for service of locomotives shall be determined, to specify the kind of equipment to be used on locomotives. (p. 612.)

Failing to find in the statute any grant of the power here exercised by the Commission, the appellants attempt to supply the omission by ingrafting certain passages in the *Napier* opinion upon the statute. In this way they disregard utterly the unlike offices performed by statutory enactment and judicial opinion, and ignore the dissimilarity in language appropriate for statutory purposes and that equally appropriate for the purposes of court opinions. This reasoning of the appellants also loses sight of the question decided by the Court, and the propriety of interpreting the language of the opinion in the light of, and within the circumscription of the question so decided. The Court was

not concerned in the *Napier case* with the federal procedure by which changes in the rules could be brought about. It is not denied that changes in such rules, although by statute only the carrier is authorized to initiate them, may not become effective until "filed with and approved by the Interstate Commerce Commission." It is not denied that the Commission's action of approval is the final step that gives obligatory force to changes in rules. Bearing in mind that the issue involved in the *Napier case* was whether or not the federal law had entered or occupied the field sufficiently to exclude state action, it becomes clear that within the four corners of that issue there was no need in the opinion laboriously to spell out the procedural steps necessary to the exercise by the Commission of the final act of approval. Viewed from the standpoint of the issue involved, it served all purposes to refer merely to the final step, that is to say—the Commission's exercise of power, as the vitalizing act that proved federal occupancy of the field. Indicative of the generic sense in which the Commission is frequently referred to in the opinion in the *Napier case,* is the reference to the duty of the Commission to inspect. The fact that the chief inspector and the two assistant chief inspectors, "who shall have general superintendence" of the local inspectors, are independently and directly appointed by the President, lends force to the view that the references in the *Napier* opinion to the powers of the "Commission" were not intended in any literal sense, but rather that these references should be understood as having regard for the composite federal machinery set up by the statute, without intention to delineate precisely the respective participations of the carriers, the inspectors and the Commission. Such a reading of the opinion in the *Napier case* has appropriate regard for the issue there before the Court, whereas, on the contrary, the

construction urged by the appellants divorces the text of the opinion from all relationship to the issue adjudicated.

The ruling of the Court below, on the question of the Commission's power to proceed as it did, is tempered by the following language in its opinion:

> "Were the question one of first impression, and we had nothing before us but the language of the act itself, this court would have difficulty in finding legislative support for the jurisdiction exercised by the Commission in this instance, except through a very broad application of the rule of liberal construction." (R. 208.)

Later on in its opinion, the Court makes reference to the *Napier* case, and says:

> "Advised by it, we find necessity to uphold the jurisdiction of the Commission in this specific instance." (R. 209.)

It would appear that the lower Court, cognizant of the fact that this case would undoubtedly reach the Supreme Court, with appropriate deference, deemed it more becoming to forebear from explaining the intendment with which, isolatedly, certain language had been employed in the *Napier* opinion.

3. The Commission Cannot Acquire Power by Estoppel nor by Its Own Unlawful Acts.

In its opinion, the District Court observed that the Commission had on numerous occasions amended the rules prior to the *Napier* decision. (R. 209.) The Court refers to twelve orders prior to July, 1925, in which the Commission amended eighteen of its rules to require improvements in or installations of safety devices on steam locomotives. A reference to the Commission's orders[7a] in

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7a. "Laws, Rules and Instructions for Inspection and Testing of Steam Locomotives and Tenders and Their Parts and Appurtenances", pp. 23-36. (I. C. C. publication, 1931).

those instances discloses that a considerable number of these changes were brought about as the result of conferences between the chief inspector and committees representing all the railroads, or "upon the request of the representatives of the carriers, which modifications were agreed to by the representatives of the employees interested and by the chief inspector of the Bureau of Locomotive Inspection," and in other cases the orders do not show who initiated the changes, simply reciting that the subject of the rules and instructions "being under consideration, it is ordered," etc. The inference that the Commission has, over a long term of years, established a practice of initiating changes in the rules appears not borne out by the recitations in the orders referred to.

In this connection, the Commission's brief (p. 45) refers to the Commission's orders in the so-called *Cab Curtain Case,* 142 I. C. C. 199, and the so-called *Fire Door Case,* 151 I. C. C. 448, wherein the Commission had adopted a procedure similar to that followed in the instant case.

Although, in the past, the carriers refrained from contesting these two particular orders which were subject to the same charge of illegality that is asserted in this case, that circumstance does not constitute an estoppel against the carriers in this case. An administrative body may not by its own construction make up for lack of statutory power. As was said in *Texas & Pacific Ry. Co.* v. *U. S.,* 289 U. S. 627, 640:

> "Where a statutory body has assumed a power plainly not granted, no amount of such interpretation is binding upon the courts. *Interstate Commerce Comm'n* v. *C., N. O. & T. P. Ry. Co.,* 167 U. S. 479, 510."

See also *United States* v. *Missouri Pacific R. Co.,* 278 U. S. 269, 280.

In this connection, it may be observed that apparently

the Commission did not always, and perhaps prior to the *Napier case* not at all construe its power to the extent that it was here attempted to be exercised. Rule 101, approved by the Commission in 1915, provides:

> "The railroad company will be held responsible for the general design, construction, and maintenance of locomotives and tenders under its control."

Previously, in those rules originally promulgated in 1911, applicable only to boilers, similar provision had been incorporated. Thus, all concerned, including the Commission, evidenced an understanding of the intendment of the statute in line with that here urged by the appellees.

4. Procedure Unauthorized.

The complaint before the Commission alleged that the railroads were violating the Boiler Inspection Act by operating locomotives equipped with hand reverse gears, in that such type of gear is inherently unsafe in principle and design, and prayed for an order commanding the defendants to "answer charges" and to "cease and desist from the violation of the Boiler Inspection Act." (R. 26-27.) It was drawn after the fashion of complaints in rate cases, and was entertained, tried and disposed of by the Commission in similar fashion.

Nowhere in the statute will be found any provision that confers power on the Commission to act as arbiter of any alleged violation of Section 2 of the statute, except to the extent of appeals by a carrier from decisions of the inspection service. Again, reference to the legislative history shows the "power to require and compel obedience to the provisions of this section * * * and enforce all needful rules * * *" (S. 6702, Sec. 3, before amendment—see appended table) was by Congress intentionally withheld from the Commission. Unless the power be found in the Boiler Inspection Act, no provision of the Interstate Com-

merce Act is available to supply such power. Where the legislative intendment is otherwise, we find specific provision in that behalf, as is indicated in the case of the Hours of Service Act, Section 4 of which now constitutes 45 United States Code, Section 64, wherein it is provided:

> "It shall be the duty of the Interstate Commerce Commission to execute and enforce the provisions of this chapter, and all powers granted to the Interstate Commerce Commission are hereby extended to it in the execution of this chapter."

That statute was enacted in the year 1907, and when, four years later, the Boiler Inspection Act was enacted, it is significant that no similar provision was contained therein.

II.

LACK OF ESSENTIAL FINDINGS OF FACT.

Assuming the Commission had authority to make changes in rules and authority to proceed as in a rate case, appellees contend (Pet. X, R. 11-12) the order should be set aside because devoid of "basic or essential findings required to support the Commission's order." *Florida* v. *United States,* 282 U. S. 194, 208, 213-15; *Ill. Cent. R. R. Co.* v. *Public Utilities Comn.* 245 U. S. 493, 507-9; *New York* v. *United States,* 257 U. S. 591, 600.

The Court need not look beyond the complaint and the order itself to determine this question. It requires no consideration of the facts. *New York* v. *United States, supra.*

The complaint alleges all locomotives equipped with manually operated reverse gears are in such condition that they cannot be operated without unnecessary peril to life or limb, because the hand reverse gear is "inherently unsafe in principle and design." The contention of complainants throughout the entire case has been that the mere fact that an engine is equipped with a hand reverse gear, alone con-

demns it under the Boiler Inspection Act. (Comp. Exceptions to Proposed Report, R. 73-81.)

The Commission's report states: "The question of fact presented for determination is whether the use of locomotives equipped with hand reverse gear, as compared with power reverse gear, causes unnecessary peril to life or limb." (R. 51.) Successful maintenance of the affirmative of this issue under the pleadings involved the establishment of three essentials: (1) The inherent impossibility of operating an engine with a hand reverse gear without unnecessary peril to life or limb; (2) the antithesis of this as to power reverse; and (3) that other devices will not rectify the alleged objectionable features of hand reverse gear.

None of these things was either in form or substance found by the Commission. Throughout its report it treated the hand reverse gear in the abstract. It put all hand reverse gears in one class, and all power reverse gears in another. The arguments put forth by the Commission in its report are directed against the hand reverse gear as a device. Yet the record is bare of anything in the way of definite statements (See *Ill. Cent.* v. *Public Utilities Commission, supra*), which singly or collectively are the equivalent of these essential findings, and it is further devoid of primary findings which would have been sufficient to support either of these ultimate findings, if made.

Since the Commission decided in this case to "split the difference," so to speak, as regards the manually reversed locomotives it would require to be equipped with power reverse gears, it was obviously in a serious dilemma in the matter of findings. It could not make essential finding (1), above, as to locomotives above the weights prescribed by its order without thereby condemning locomotives below the prescribed weights. If the heavier engine was to be condemned under the Act because equipped with a reverse

gear "inherently unsafe in principle and design," it would follow that *any* engine so equipped must also be condemned, regardless of weight, size, or any other consideration. The cause being inherent in the reverse gear must necessarily exist upon all locomotives so equipped.

Appellants' briefs quote from the report a passage having to do with the difficulty of drawing a line of demarcation, in which it is stated that while the evidence does not in all cases show the size of locomotives on which accidents have occurred, it does indicate the greater number occurred on heavier engines. This is far from a finding that all locomotives equipped with manually operated reverse gears cannot be operated without unnecessary peril to life or limb; or that any of them cannot be so operated. We respectfully submit that nothing can be found in this report either separately or collectively equivalent to such finding. Appellants make no claim that any statement or statements in the report are the equivalent of essential findings (2) or (3) which we have mentioned above.

III.

THE COMMISSION DID NOT CONSIDER ALL THE EVIDENCE; THE ORDER IS CONTRARY TO AND UNSUPPORTED BY THE EVIDENCE.

Assuming the Commission's authority to proceed with the hearing in this case and also that its order is held to be supported by sufficient basic or essential findings, then such order must be held void if any essential finding was unsupported by evidence or contrary to the evidence. *Chicago Junction case,* 264 U. S. 258, 265, and cases cited in note 9, thereof. Also as stated in *Interstate Commerce Comn.* v. *Louisville and Nashville R. R. Co.,* 227 U. S. 88, 91, "administrative orders, quasi-judicial in character, are void * * * if the finding was contrary to the 'indisputable

character of the evidence.' " And again at page 92: "The legal effect of evidence is a question of law. A finding without evidence is beyond the power of the Commission." See also *United States* v. *Abilene & So. Ry. Co.,* 265 U. S. 274, 288. And as previously stated by the same justice (Mr. Lamar) in *Interstate Commerce Commission* v. *Union Pacific R. R. Co.,* 222 U. S. 541, 547, referring to the Commission's authority under the Interstate Commerce Act to regulate rates: "if the authority therein involved has been exercised in such an unreasonable manner as to cause it to be within the elementary rule that the substance, and not the shadow, determines the validity of the exercise of the power," it is void.

Due process of law invokes these requirements and the further requirement that the Commission give fair consideration and at least some weight to all phases of the evidence having a reasonable bearing upon the issues before it. A failure to do so amounts to a denial of due process, and the courts will exercise an independent judgment as to both the law and the facts when questions of this character are raised. *Bluefield Water Works Co.* v. *Public Service Commission,* 262 U. S. 679, 689. The railroads before the Commission as defendants in this matter were entitled to present their evidence and argument "before a tribunal bound not only to listen but to give legal effect to what has been established." *Oregon R. R. & N. Co.* v. *Fairchild, et al.,* 224 U. S. 510, 525. Disregard by the Commission of substantially uncontradicted evidence having a bearing on an issue in the case, requires the setting aside of the Commission's order even if supported by adequate findings. *Southwestern Bell Telephone Co.* v. *Public Service Commission,* 262 U. S. 276, 287-9. "To refuse to consider evidence introduced or to make an essential finding without supporting evidence is arbitrary action." *The Chicago Junction case,* 264 U. S. 258, 265.

An examination of the evidence in this case discloses many instances where the Commission failed to follow these rules, thereby fully justifying the action of the lower Court in setting the order aside.

The Record Fully Supports the District Court's Findings and Conclusions.

The District Court found that:

> "In its consideration of the case the Commission failed and refused to give consideration or legal effect to important material facts established before it by evidence substantially uncontradicted, and ignored and disregarded the indisputable character of such evidence; and reached conclusions contrary thereto and unsupported by any substantial evidence; all as more particularly shown below:."

This is followed by a statement detailing the evidence referred to—See findings 4(a)—4(p) and (5), R. 219-23. These findings will be taken up below. References will be made herein both to the printed record and the Appendix submitted herewith, wherein we have abstracted all of the evidence presented by complainants and the Class I railroads covering certain subjects with respect to which the record is voluminous. It begins with an index and a list of witnesses; and throughout contains page references to the printed record. It is designed to facilitate reference to the evidence.

FINDING 4(a): The use of power reverse gears on locomotives has not eliminated all accidents caused either in connection with such use or by failure of the gear properly to function. Such accidents have included the same types as occur where manually operated gears were used, viz., strains, bruises, cuts, broken bones, etc., received in the engine cab in connection with handling the reverse mechanism, and injuries to enginemen and others outside the cab when oiling or otherwise attending to their engines. Accidents of the former type are more numerous on hand reverse locomotives, and of the latter type more numerous accidents have occurred, including several deaths from operation of power reverse gears. (R. 219.)

That the use of power reverse gears has not eliminated reverse gear accidents is conceded by appellants. (Johnston's Br. 20.) They, however, point to the relatively greater number of injuries shown of record to enginemen while operating the reverse lever in the cab with the hand lever type of gear.[13] While the oral evidence in the case shows approximately the same number of injuries with power reverse gears (App. 135-167) as with hand reverse gears of all types (App. 42-60), the evidence as a whole shows a greater number of hand reverse injuries. This is due to the presence in the record of 231 Form T accident reports (Ex. 13, R. 1420-86), filed by the carriers pursuant to law, received as admissions against interest. The railroads were not permitted to put in such reports to show additional power reverse gear accidents. (R. 1294)

Injuries to Men in the Cab.

The evidence shows without contradiction a number of injuries to men in the cab while operating power reverse gears. These injuries were of the same character as those

13. Accidents with hand screw gears have been less frequent than with either hand lever or power reverse gear, as will be shown later.

shown by complainants with respect to hand reverse gears, viz., cuts, strains, bruises, and broken bones, and were caused by the power reverse lever kicking or the power reverse wheel spinning, kicking or working hard.

The following table sets forth in the first group these injuries shown by defendants' witnesses, and in the second group those included in Exh. 13 (Form T reports) submitted by complainants:

DEFENDANTS EVIDENCE.

Name	Year	Description of Injury	Time Off Duty	Name of Power Reverse Gear	Appendix Page	Record Page
Fraley	1928	wrenched back	10 days	Mellin	135	(455–6)
Brotherton	1929	cut finger	None	Alco Type E	136	(485)
Burkhalter	1930	thumb sprained & dislocated	2 days	Ragonnet	144	(691)
Coyle	1927	2 broken bones in hand	Not stated	McCarrol	147	(768)
Colache	1930	hand blistered	None	Alco	148	(803)
Dickhaut	1928	sprained shoulder	3 weeks	Precision	149	(886)
Maloney	1913	badly bruised arm & shoulder	None	Mellin	163	(1246–7)
Harris	1931	arm cut open and bruised	4 weeks	Precision	164	(1315)
Emsworth	1931	broken wrist	69 days	Precision	165	(1316)
Brumfield	1928	broken wrist	30 days	Precision	168	(1560)
Ryan	1929	broken wrist—both bones	68 days	Precision	147	(749)
Slosson	1928	bruised knee	Medical treatment two years	Precision	147	(757)

Total number of injuries to men in cab.....12

EXHIBIT 13.

COMPLAINANTS EVIDENCE.

*Blowers	1929	4 toes amputated	Permanent disability	Alco	140	(1430)
Gordon	All 1929 And 1930 (R-1420)	contusion of left eye	8 days	Precision		(1425)
Miller		back bruised	10 days	Alco		(1428–9)
Rupp		wrist sprained	15 days	Mellin		(1447)
Chadwick		rib fractured	10 days	Ragonnet		(1451)
Cook		elbow bruised	8 days	Barco		(1452–3)
Ringlet		cut finger	4 days	Franklin A-7		(1454)
McDonald		wrist sprained	6 days	Precision		(1462)
Hailey		wrenched back	Not stated	Ragonnet		(1465)
Friend		arm bruised, wrist sprained	45 days	Unnamed		(1458)
†Ryan		wrist fractured	61 days	Precision	147	(1461)
McDaniel		thumb dislocated	11 days	Precision		(1469)

Total: 12 cases.

*Not in cab when injured.
†Included in preceding table.

Appellants do not and may not contend these accidents did not occur. They seek first to justify the Commission's disregard of them by pointing out that they "were scattered over a period of 18 years." The facts are that one such accident did occur eighteen years before the hearing and all of the remaining ones occurred in the years 1927 to 1931, inclusive. Next it is said two of the injuries were "inconsequential." That they were slight or minor injuries is true. In this they are of the same class as the great majority of injuries due to hand reverse gear operation, as will be shown in our discussion of finding 4 (h).

Three occurred with types of gears termed "obsolete" by the Commission, although two such occurred in the years 1927-1928. All others occurred with the gears now in most general use and available on the market for installation in compliance with the Commission's order.[14] The latest type (Precision, R. 1381-2) caused the greatest number of these injuries to men in the cab. Appellants state these were "due to lack of proper maintenance of the gear, or happened under circumstances which would have caused the same result with manual gear." This is clearly not borne out by the evidence as to Harris (R. 1315, 1566), Ryan (R. 749-51), Dickhaut (R. 886-7), and Slosson (R. 757), but if true would in no way impeach the Court's finding. If we assume these same accidents were all due to improper maintenance and would have occurred with hand reverse gears, it simply proves the point made by the Court that installation and use of power reverse gears have not eliminated the class of injuries to men in the cab upon which complainants' case and the Commission's order is exclusively grounded. If we assume that a large num-

14. Exhibit 58 shows in use in 1931 on 134 railroads represented by American Railway Association: Ragonnet 11,382; Alco 9,176; Barco 558; Precision 2,990; all others 2,241; total 26,447. (R. 1501-36.) Exhibit 10, sheet 4 (separate volume of exhibits) shows total number of power reverse gears in use on 157 such railroads on Dec. 31, 1930 was 27,568.

ber were caused by improper maintenance, that, too, simply puts them on a parity with the hand reverse gear accidents cited by appellants, as will be later developed.

The report of the Commission states "Complainants urge that there is no liability of injury to the engineer in the cab due to the action of the reverse gear on locomotives equipped with power reverse gear." (R. 58) This passage, coupled with the extensive elaboration found in the report with respect to the dangers attending hand reverse gear accidents to men in the cab and the absence of any statement in the report respecting such power reverse gear accidents, demonstrates that the Commission did ignore the uncontradicted evidence of these 23 power reverse gear injuries to men in the cab. The uncontradicted evidence of much erratic performance of power reverse gears productive of hazards to men in the cab was also disregarded by the Commission (App. 70-97).[15]

Since complainants were contending, as stated by the Commission, that power reverse gears had eliminated injuries to men in the cab, it would seem to have been very pertinent and important to the Commission's inquiry to determine whether or not this contention was supported by the evidence. That it was entirely unsupported, and in fact directly contrary to the uncontradicted evidence which we have referred to herein, is beyond dispute. The Court's finding in this behalf was fully justified.

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15. This evidence is very briefly referred to in the abstract and shows numerous cases of untoward performance by the power reverse gear, such as "creeping," "pumping," "fluttering," freezing, broken air pipe connections, gear parts, etc., and cases where faulty operation of power reverse gear caused the valve gear to be thrown into the reverse motion position while the engine was moving forward. Also in Appendix 135-167, 30 accidents are shown wherein personal injuries were not involved. In 21 of these 30 cases important property damage resulted. A number of these 30 accident cases involved danger to men in the cab, while a number of others did not because locomotives moved of their own volition while no one was in the cab. These accidents occurred because of the power reverse gear's failure to hold the locomotive valve gear to a fixed adjustment when normal air pressure is absent on a locomotive, a condition which cannot exist when hand reverse gear is used. This will be discussed under findings 4(b) and 4(c).

Injuries to Men Outside of Cab.

While accidents due to hand reverse gears are shown to be almost entirely limited to injuries of the character mentioned to men in the cab, the evidence shows without contradiction numerous injuries, many of them of a far more serious character, and deaths, to men outside of the cab resulting from the use of power reverse gears.[16]

The power reverse gear injuries to men outside the cab are of several classes:

(1) *Engines crashing into round-house walls or into turn-table pits, etc.* These will be discussed under findings 4 (b) and 4 (c) below.

(2) *Accidents caused by valve gear moving without warning when air pressure is being pumped up or because of "creeping" or other defect of power reverse gear.* Because all power reverse gears depend upon the presence of normal air pressure on the locomotive to maintain the valve gear adjustment, it frequently happens, particularly when locomotives are in round-houses or at terminals between trips, that the valve gear parts assume a different adjustment, due to the lack of normal air pressure in the power reverse gear. Thereafter, when the air pressure is pumped back up to a certain point it will cause the valve gear parts to suddenly change their position so as to bring them back corresponding to the position of the operating lever or wheel of the power reverse gear. These movements of the valve gear parts result entirely from the change in air pressure and occur without any change in the position of the power reverse lever or wheel. They

16. App. 135-168 briefly shows particulars of 52 separate injuries and 9 deaths; also 30 additional accidents where no personal injury resulted but in 21 of which property damage occurred in every instance fraught with danger to persons around the locomotive or in its path because of the uncontrolled movement of such locomotives.

occur without any action on the part of the locomotive operator and often occur when no one is in the cab. The parts are moved by the uncontrolled force of compressed air. In other cases the power gear fails to hold the valve gear adjustment because of air leakage or "creeping." Manifestly, any engineman, hostler, mechanic or other shop man who is working or oiling around the valve gear parts is in danger when movements of this kind occur.

That such erratic movements of the gear mechanism have resulted in numerous and severe injuries is forcibly demonstrated by the testimony in the record (Burkhalter, machinist's arm caught; R. 692; App. 144. Wilkins, 3 fingers amputated; R. 718-9; App. 146. Henry, fractured skull; R. 804; App. 148. Lieber, fireman's arm broken and 2 bones in hand broken; R. 846; App. 149. McPhail, engineer's arm broken 2 places; R. 898-9; App. 150. Waldrip, machinist's arm broken; R. 1154-5; App. 157. Rector, machinist's helper's hand mashed; R. 1156-7; App. 157-8. Dalzell, fireman, killed; R. 1088-92; App. 151-2. King, engineer's hand cut and finger broken; R. 1142; App. 156. Hughes, machinist's wrist broken, fingers badly cut; R. 1202-4; App. 161-2. Lambright and Miller (Ross death); R. 1316-8, Ex. 101, R. 1567-9, App. 165-6). Very serious injuries, 2 deaths and a considerable loss of time were involved in these cases. In the Henry case, for example, the engineer was off duty 17 months and received a settlement of $10,000. In the case cited last Engineer Ross was severely injured (and later died) because a creeping power reverse gear caused a locomotive to move of its own volition while he was attempting to remove a broken brake-beam beneath the tender.

The erratic performance of the gear jumping when air is being pumped up, peculiar to the power reverse gear,

is not disputed by appellants.[17] There is much proof showing it to be quite a frequent occurrence (R. 505, 542-3, 651-2, 653, 670, 681, 710, 1156, 1216).

It is not possible for accidents such as these to occur with a locomotive equipped with a hand reverse gear, because the valve gear is securely held in place by the direct connection with the reverse lever. The valve gear cannot move unless the *hand* reverse lever or wheel is moved (R. 710, 1146).

(3) *Accidents resulting in injuries to employes working around locomotives, due to the movement of the power reverse gear by another employe.* Twenty-two such accidents are shown in this record. (Brotherton: Oiler O'Neill's hand mashed; blood poisoning, lost time one year; R. 486; App. 136. Crystal and Von Bergen: Engineer Boggs death; R. 550-2, 1181-2; App. 137, 161. Rasmussen: engineer's arm caught but not broken; R. 633-4; App. 139. Buckner: engineer thrown 5 feet; R. 670; App. 141. Sawyers: engineer's wrist badly crushed; R. 672-3; App. 142. Wells: Machinist Garrett's death; R. 712, App. 145-6. Truman and Murphy: engineer's arm broken, off duty 2 years, $8,750 damages; R. 735, 737; App. 146-7. Stearns and Burnett: Helper Bunnell death, damages $6,000; R. 1096-8, 1110-11; App. 152, 154. Snyder: engineer badly crushed through chest, breaking 5 ribs and affecting lungs, off duty 9 months, damages $7,000; R. 1136-8; App. 155. Law, Heirgood and Pearson: road foreman Gilbert, injured about face, in hospital 30 days; R. 1139-41; App. 155-6. Canady: Laborer Nomato's death; R. 1147-9; App. 156-7. Brown and Smith: laborer's arm broken, off duty 7 weeks, damages $240; R. 1158; App. 158. Kiely: hostler Abbott's

17. In the brief on behalf of A. Johnston, *et al.*, at pages 29-30, it is said thereof: "* * * if, while the air pressure is being pumped up he (the engineer) places his arm or body in the valve motion before this process of adjustment has been completed he is, of course, liable to be caught by the movement thereof." Also see I. C. C. Brief, 73-4.

death: R. 1159-60; App. 158. Crase and Wisham: engineer's hand cut nearly off, blood poisoning, off duty 2 years and 4 months, damages $8,700; R. 1160-2; App. 158-9. Gallagher: fireman thrown 6 or 8 feet, bruised chest, off duty 10 days; R. 1163-4; App. 159-60. Arnold: fireman struck and caught, torn ligaments and muscles of back, off duty 12 days; R. 1165-6; App. 160. Cherry: engineer's arm crushed, necessarily amputated, pension for 5 years, settlement $3,500; R. 1166-7; App. 160. Black: engineer's arm broken; R. 1169; App. 161. Evans: engineer's fingers mashed, off duty 3 months; R. 1209-10; App. 162. Persch: fireman's fingers broken and split, off duty 46 days; R. 1272-3; App. 164. Collinson: engineer's foot crushed; R. 1323; App. 167.)

On the other hand only three accidents (two injuries) are shown to have occurred in similar circumstances with hand reverse equipment. In one of these cases the engineer whose head was caught was slightly cut about the temple and face but lost no time (Witness McGuire, R. 713-5). The evidence leaves no room for doubt that had the engine been equipped with power reverse gear this engineer would have met the fate of Engineer Boggs, Machinist Bunnell, Laborer Nomato, *et als.*, who were crushed to death by the overpowering and unfeeling force of the power reverse gear. In the second case a boilermaker's helper had his toes caught and squeezed but was not injured and went right on with his work. The greater force of the power reverse gear, had there been one on that engine, would likely have mashed or broken his toes (Witness Canady, R. 1148-9). The third case was brought out on rebuttal by complainants. A fireman suffered a broken bone in his little finger, losing three weeks' time. In this case the result would have been the same with power reverse gear, as the little finger was pinched against the gear frame *at the end of the movement of the lever* and *there was no obstruction*

during the movement. Complainants were very diligent throughout in presenting any hazards connected with operation of the hand gear. The fact that complainants on rebuttal were able to show but one comparatively trivial injury to an engineman outside of the cab or a person working, oiling or inspecting around a locomotive demonstrates the dearth of such injuries with the hand gear. The reasons therefor and for the relatively slight injuries resulting from such accidents with hand gears are developed in the discussion of finding 4 (e) below.

(4) *Accidents resulting from runaway engines due to the failure of the air supply.* Accidents having serious consequences occurring on descending grades with locomotives running light, *i. e.*, without cars being coupled to the locomotives, are illustrated by four instances of record. In one case the fireman was killed, the engineer badly injured, the locomotive and right of way were damaged to the extent of $2,800, and the wrecking of two passenger trains on a dangerous mountain grade was averted only by the greatest good fortune. As the air leaked off the power gear crept forward, causing control to be lost. All would have been prevented with a hand reverse gear which could have been used as an emergency brake (Dalzell case, R. 1088-92; App. 151-2). In a second case, under similar circumstances, three men were hurt—one very seriously—with property damage of $4,488. When the engineer discovered the air pressure was getting low he endeavored to reverse the engine but the power reverse gear would not function. He stated he could have controlled the engine and averted accident had it been equipped with a hand gear. (Molte case, R. 1318-20; App. 166-67; Ex. 102 & 103, R. 1570-5) In Bailey's case he and others miraculously escaped serious injury but there was damage to equipment amounting to $2,885 when his engine luckily ran into an open switch and struck empty cars on a siding instead

of continuing on the main line (R. 1103-5). Under similar circumstances Cooksey was injured severely, two others less severely, two locomotives badly damaged by collision and 68 sheep were killed; damages to the extent of $17,500 occurred in addition to $1,200 paid Cooksey. (R. 815-8; Ex. 40 and 90, R. 1497, 1561-2; App. 148-9). In another case Aita had a less serious smashup fraught nevertheless with very dangerous possibilities; damage to equipment, $3,000 (R. 702-3; App. 145). Each of these men testified he could have avoided his accident had the engine been equipped with a hand reverse gear. Bailey, however, was not positive because his engine was equipped with Young valve gear and disconnected on one side (R. 1105-6). The evidence showing the ineffectiveness of auxilliary steam connections to prevent accidents of this type is referred to under Finding 4 (d) (pp. 60-5, hereof).

(5) *Injuries to men endeavoring to restore operation of power reverse gears or in making repairs.* Engineer Blowers lost 4 toes when his engine moved slightly while he was necessarily standing on the main rod in working on the Alco power reverse gear in an effort to stop its creeping (App. 140, R. 1430, 637). Burkhalter suffered a crushed foot and loss of one toe in a somewhat similar manner in repairing gear to stop creeping (App. 144, R. 691, 693). The power reverse gear on Engineer Maloney's engine stuck and would not operate. His fireman got out on the ground with the shaker bar to loosen up the gear and it flew up and hit him in the arm, causing him to lose about 2 weeks' time (App. 163, R. 1247). Machinist Nye while renewing packing in reverse gear cylinder was thrown to ground when packing leather gave way; off duty 7 days (App. 163, R. 1237). Road foreman Gilbert received a terrific blow in the face, putting him in the hospital for more than 30 days, when the power reverse gear suddenly dropped to forward motion as he and two other men were endeavoring

to repair it (App. 155-6, R. 1139-41). The power reverse piston rod was broken on Engineer Hailey's engine. In endeavoring to restore gear operation with a shaker bar the power reverse piston shot out of the gear, striking the shaker bar and tearing ligaments loose in his back; off duty 30 days (App. 161, R. 1168). Engineer Landers received a severe burn on the wrist while thawing out power reverse gear which had frozen and become inoperative (App. 150, R. 927). Brakeman Collison saw an engineer's foot crushed as he was standing on the counterbalance of the driving wheel turning air into power reverse cylinder, which caused engine to move (App. 167, R. 1323). These accidents would not have occurred had the engines been equipped with manual reverse gears.

A reading of the Commission's report makes it apparent that it failed to give consideration or legal effect to the foregoing evidence demonstrating several types of accidents occurring in the use of power reverse gears. It chose to contemplate only the injuries to men in the cab and closed its eyes to the far more serious consequences attending the use of power reverse gears, to men outside of the cab. This will be further shown in our discussion of certain other findings. Appellants in their briefs herein do not contend any of the foregoing evidence is disputed. They point out that these power reverse gear accidents are "obviously of a different kind" from those occurring with manual reverse gears. They make the broad assertion that these men were the victims of their own carelessness as contrasted with the manual reverse gear injuries shown by complainants' witnesses wherein it is contended the injured men had no opportunity of protecting themselves from the erratic performance of the hand gears. By these and other processes of reasoning appellants seek to convince the Court that the Commission was warranted in disregarding the evidence submitted by the railroads and was justified in giving it no legal effect.

FINDING 4 (b): Hand gears being simpler in construction, respond more readily in cases of emergency; and in such situations when air pressure is not available to operate gears, may be quickly and effectively employed to control movement of the locomotive and avert accidents; whereas in the same situation power reverse gears depend upon air pressure, so that an engine equipped therewith cannot be so controlled except where there is time to cut in an emergency steam connection to operate the gear. (R. 219, 220.)

On a locomotive when breakage or failure to function occurs in the pump, the air reservoir or any of the air pipes, valves or connections the resultant loss and absence of the usual supply of compressed air renders the brakes on the locomotive and tender inoperative.[18] If the locomotive happens to be equipped with a power reverse gear this loss of air supply at the same time renders the reverse gear inoperative. If the locomotive is attached to a train and the air connections through the train are coupled up, the train brakes will usually still operate in such an emergency.[18a] However, if such emergency occurs when the engine is running "light," *i. e.*, without cars attached or when coupled to cars in switching or yard service, there remains no means of stopping the locomotive or controlling its speed or movement except by use of the reverse gear. As will be seen from the evidence referred to, the locomotive in such circumstances may be stopped, or its speed controlled if that be desired, by reversing the gear and admitting steam pressure into the locomotive cylinders against the movement of the pistons. In this way the steam pressure is applied to reduce the movement of the loco-

18. Numerous instances due to breakage and freezing are shown (pp. 63-4, hereof, Notes 25, 26 and 27).

18a. Instances were shown where the train brakes also failed to function. (R. 776-8.)

motive rather than to accelerate it, thereby acting as a brake. The hand reverse gear is immediately available in such circumstances for emergency use. Before the day of the air brake the hand reverse gear was commonly used in this way for braking purposes. (R. 574, 639, 1227, 1304.) It is still frequently used in emergencies to supply needed braking power, either when the brakes are inoperative or to supplement the effect of the brakes when quick action is needed to avert an accident.[19] Where air supply is present the evidence shows without contradiction that power reverse gears are used in the same way and for the same purposes,[20] but when the air supply is lacking power gears cannot be so used unless the circumstances are such as to allow time to "cut in" the steam pressure to the power reverse gear. This requires time often not available in an emergency of this character and if absence of air pressure is due to breakage of air pipes it is frequently not possible to get either air or steam to the power reverse gear. (See pp. 62-4, hereof.) The evidence shows steam connections to have been ineffective in a number of important emergencies and unsatisfactory for general use. This will be further discussed under Finding 4 (d). On the other hand, the manual reverse gear is available for instant emergency use. It has the further advantage that its movement and use may be speeded up in such an emergency, whereas this may not be done with the power gear. Engineers testified to a number of specific instances where quick and effective action in the use of hand reverse gears averted collisions, wrecks or other accidents and where the slower

19. Avoided accidents by using manual gears as a brake: Buckner, R. 670-1; Ryan, avoided damage to dining car, engine weighing 200,000-250,000 pounds, R. 750; Welch, avoided collision with passenger train, R. 639-40; Hoeft, controlled a train of 50 cars on descending grade, R. 777-8; other instances: R. 1106, 1156, 1208, 756 (handled engine with only one main road and no brake), R. 864, 817, 833-4, 836.

20. McHugh, R. 1329; Austin, R. 324; Earp (air-reverse too slow; smashed two cars; hand reverse would have prevented damage, R. 1027; Bailey, same, smashed caboose, R. 1103.)

availability of the power reverse gear in the emergency would have prevented effective action. (R. 756, 757, 762-3, 766, 950-1; and cases cited in Note 19.)

That the Commission refused to give any legal effect whatever to this uncontradicted evidence is shown by the following quotation from its report:

> "In isolated instances, due to one cause or another, locomotives have unexpectedly moved when no air pressure was available with which to operate the air brakes. Under such circumstances it is possible in some instances to stop the locomotive by reversing the engine and admitting steam to the cylinders. The carriers urge that this is a safety feature which may be employed with hand reverse gear but which is absent with power reverse gear, because air pressure is necessary to operate the power reverse gear just as it is necessary to operate the air brakes. This argument is no more forceful against the use of power reverse gear than it would be against the use of power brakes." (R. 57-8.)

Appellants urge the Commission was warranted in disregarding this evidence for two reasons. First, they refer to the Moore case (R. 1361) and the McHugh case. (R. 1324-5.) In each of these cases the witness endeavored to use the manual reverse lever as an emergency brake but was unsuccessful in so doing. Moore was moving his engine forward in the roundhouse. When about 20 feet from the roundhouse wall he endeavored to apply the air brakes, and finding the brakes did not operate immediately tried to reverse the engine with the hand lever. He was prevented from doing so because the quadrant was out of order (he said "a piece hung in the quadrant"—presumably meaning it was blocked). Because of his inability to operate either the brakes or the reverse gear his engine ran halfway through the roundhouse wall. On cross-examination he stated unequivocally that had the hand lever been in operation he could have stopped the engine and pre-

vented it going into the wall. He further stated he had previously used hand reverse in such cases and been able to stop in distances of 18 or 20 feet. (R. 1363.) McHugh in the year 1914 was backing his locomotive intending to couple onto a baggage car, and when 10 feet away and moving 7 miles per hour endeavored to apply the brakes and found them frozen and inoperative. He then at once reversed the engine with the hand lever, but (evidently because he didn't drop the latch) it flew back and his engine hit the baggage car. (R. 1325-1329.) In referring to use of the hand reverse for braking purposes, he said:

> "I have used it a good many times, but I never had any trouble, except this one time * * *" (R. 1324.)

On cross-examination:

> "Q. During your long period of experience you have used the Johnson bar a good many times for that purpose?
>
> A. Oh, yes. I guess every man has.
>
> Q. And it is effective to control the speed of the engine, is it not?
>
> A. It certainly is. It is good to retard the momentum the other way. That is the idea. * * *" (R. 1329.)

These were complainants' witnesses on rebuttal. It is contended their testimony shows the hand lever is not effective for braking purposes in emergencies. The Court will note that on the contrary it agrees with the testimony of the carriers' witnesses. Complainants' leading witness in chief also mentioned this emergency use of hand gears. (R. 250.) The appellees have not contended that the hand lever will be successful *in every instance,* but they have shown by evidence, the indisputability of which cannot be gainsaid, that it is usually susceptible of quick and effective use for braking purposes in an emergency and, because of its simpler construction, more flexible operation, and non-dependence upon air supply, it is far superior to the power reverse gear, as we have pointed out.

The brief of appellee Johnston, *et al.*, herein also refers to three cases in which it is said men were injured in using the hand lever for braking purposes. Neither Troxel's (R. 1437) nor Keller's (R. 1440) slight injury was incurred while he was using the hand lever as a brake. Leonard was, and he let the lever get away from him, catching his foot against the boiler head where he had braced it. (R. 1463.) His bruised and lacerated foot and leg is the only injury shown to have been incurred in using the hand lever for braking purposes. Such remote possibility of slight injury as may exist does not change the outstanding fact of the greater availability of the hand lever to avert accidents in cases of emergency.

Appellants also refer to the testimony of Mr. E. B. Hall, General Superintendent of Motive Power of the C. & N. W. Ry. Co., that it would not be good practice to reverse an engine moving at high speed. Mr. Hall said "Unless I wanted to use that pressure for braking purposes, I would not do it, nor recommend it." (R. 1227.) Mr. Hall's complete testimony on this question on cross-examination (R. 1215, 1227-8) leaves no doubt that he fully recognized the propriety of use and effectiveness of the hand reverse gear as an emergency brake and had himself so used it when operating as an engineer. He is a man of many years' experience in running engines and supervising their operation. (R. 1211-12.) The testimony of a number of officials having like experience is to the same effect (R. 1304, 1116, 1130, 1243-4; including control of a train of 75 cars running 35 miles per hour without air, by use of the hand bar. (R. 1302.)

The evidence of the witnesses on both sides of the case, wholly uncontradicted, discloses the universal acceptance and employment of this practice. This evidence established a definite and important advantage in the use of

manual reverse gear over that of power reverse gear. It was a matter which should have been given full legal effect and consideration by the Commission. Appellees contend that the Commission's failure to do so was arbitrary. The District Court so found.

FINDING 4 (c): The report at p. 360 states it to be a matter of common knowledge that hand reverse locomotives sometimes move unexpectedly into roundhouse walls and turntable pits. The evidence shows that this cannot be caused by lack of air pressure and that the same unexpected movement of power reverse engines has occurred; and further, that if with insufficient air pressure available a hand reverse engine does unexpectedly start to move the same can be controlled by using the hand reverse gear for braking purposes, which could not be done with a power reversed engine. (R. 220.)

Many such unexpected movements of engines at roundhouses, shops, and terminals are instanced in the record caused by steam pressure building up in the locomotive cylinders while the engine is standing and upon the pressure reaching a sufficiently high degree causing the locomotive to move. If the locomotive is left standing *with the manual reverse lever* at the center or neutral position *no amount of steam pressure will cause it to move* because in that position the valve closes the steam port leading into the cylinder so that no steam may be admitted. Because of the direct connection and control between the hand lever (or screw) and the valve, when the lever is latched at the center position such unexpected movement of the locomotive cannot occur. (R. 1146.)

When the air pressure is not "pumped up" on locomotives equipped with power reverse gears the valve gear parts "settle," thus moving the valve so as to admit steam

to the locomotive cylinder and cause the locomotive to move of its own volition. This occurs without any movement of the power reverse lever or wheel in the cab. In such circumstances the position of the power reverse lever or wheel in the cab *does not indicate the position of the locomotive valve gear and valve.*

Appellants refer to Shockley's case.[21] On cross-examination Witness Shockley said "On those large engines there is now a lever which indicates the reverse, but that was not on this engine with which I had the accident." (R. 643.) Appellants quote this statement as authority for their claim that "Since this accident the power reverse gear has been equipped with a lever which indicates whether the air reverse has responded, so that the hostler may know whether his gear is in working condition. (Johnston Br., 34, I. C. C. Br. 74.) This inference from Shockley's vague statement is, however, contrary to the positive evidence of complainants' Witness Zouck, engineer of the Franklin Railway Supply Company which manufactures the Ragonnet gear. His testimony shows that the Ragonnet type A (used by Shockley) is substantially the same gear as the later types B and E, all three types being now in production and use. Types B and E differ from type A only in minor matters of mechanical detail, retaining the essential principle of dependence on equal air pressure on the two sides of the power reverse gear piston to maintain the position of the locomotive valve gear and valves. (R. 1376-80.) Changes in the Alco gear have been along the same

21. Hostler Shockley had brought steam pressure to 60 pounds and pumped air pressure up to 40 pounds preparatory to backing locomotive out of the roundhouse. He carefully walked around the locomotive and saw no one around or under it. He then took his place in the cab, moved the Ragonnet power reverse lever to the back-up position, and thinking the valve gear had thereby been reversed he opened the throttle, whereupon the engine moved forward, mashing against the roundhouse wall and killing Boiler-maker Foreman Bradley, who was working at a desk. He said "With hand reverse engines I have never had the experience of throwing the hand reverse lever into reverse and have the engine go forward." (R. 641-2.)

lines. (R. 1382-6; Ex. 3, Special Volume of Exhibits.) Barco and Precision gears likewise depend upon the presence of air pressure to maintain adjustment of the valve gear. All types, whether of the earlier designs or of the most recent, fail to maintain a fixed adjustment of the valve gear, as will be shown by much evidence of "creeping" elsewhere discussed herein. The same essential design of all power reverse gears, viz., the "air cushioning" of the power reverse piston, which permits creeping, also permits the locomotive valve gear and valves to assume a position different than that indicated by the power reverse lever or wheel in the cab whenever air pressure on the locomotive is absent, or has not been pumped up sufficiently.

The condition of the valve gear having "settled," peculiar to power reverse equipped engines, has been productive of numerous accidents falling in two general classes: (1) Such as Shockley's, where engineers or hostlers move the power reverse control in the cab preparatory to moving the engine and because of insufficient air pressure the valve gear is not moved with the result that the locomotive moves in the opposite direction from that intended; and (2) cases where the power reverse control in the cab is not moved from center position yet the valve gear having "settled" steam passes into the locomotive cylinders and causes the locomotive to move of its own volition. These cases may happen whether anyone is in the cab or not. Such was the case testified to by Wallace (R. 715-6), wherein one man was killed, a second man's leg was amputated, and a third man's leg was crushed. (Ex. 36, R. 1493-5.) Wallace testified, as did Shockley, that had the engine been equipped with a hand reverse gear he could have stopped it. (R. 716.) Numerous instances shown of record without contradiction show that these unexpected movements of power reverse gear

equipped locomotives have been and still are of frequent occurrence.[22] Witnesses who were present either on the locomotives or who climbed on when they saw the locomotives starting to move would have been able to stop the locomotive, had they been equipped with hand reverse gears, by reversing them and applying steam pressure against the undesired movement of the locomotive—*i. e.*, employing the hand gear as an emergency brake. These witnesses so testified in each instance, and were positive of their ability to do so based upon long years of experience.

The Commission referred to the foregoing evidence but failed to give it any legal effect, saying:

> "As to locomotives moving unexpectedly, and crashing through roundhouse walls or into turntable pits, it is common knowledge among railroad men that such movements are not confined to locomotives equipped with power reverse gear but have also occurred on locomotives equipped with hand-operated reverse gear." (R. 59.)

It is urged the Commission was warranted in so doing because of Hostler Wyatt's failure to control his engine with the hand lever when the throttle fulcrum became broken, the throttle jammed wide open so he couldn't move

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22. (1) Cases like Shockley's: Hayes, October, 1929; R. 1207; App. 162. Burnett, October, 1923; property damage $300; R. 1112-3; App. 154. Carryer, June, 1926; damage $1,200; R. 944-5; App. 151. Horan, 1915; R. 861; App. 149. Beach, 1928; roundhouse wall, tool-room and counter torn down; $500 damage; R. 705-6; App. 145. Watt, May, 1931; air leaking off rendered power reverse gear inoperative; fortunately enough air remained to set emergency brake, otherwise engine would have crashed into employees' washroom; R. 681-2; App. 143. McCaskill; collision with another locomotive; R. 553; App. 138. Ingram, switch engine ran into cut of cars; tore main reservoir off; R. 793. Gorman; R. 1277.

(2) Cases like Wallace's: Baker, April, 1922; ran into turntable smashing operator's house; turntable operator would have been killed had he not quickly vacated house; R. 943; App. 150. Wood, 2 cases; R. 907; App. 150. Traylor; R. 890; App. 150. Watt, February, 1931; R. 682; App. 143. Jeffers, July, 1930; R. 651-2; Also June, 1930, R. 652; January, 1929; R. 653; September, 1928, collision with another engine; R. 653; May, 1930; R. 654; damages to roundhouse walls, turntable pit and equipment not stated; App. 140-1. Thorp; R. 576; App. 138. Crabbs; R. 1244; App. 95.

it, and the brakes would not hold. (R. 1359-61.) The accident report states "So far as anyone has been able to determine, there was nothing defective or imperative (inoperative) about the brakes, reverse lever or valve gear on engine 7660 that would have prevented the hostler from controlling the engine after the throttle fulcrum was disconnected" (R. 1576) and that after Wyatt found he couldn't close the throttle he became "very much excited and after several ineffectual attempts to stop the engine became alarmed and deserted it about one thousand feet west of the turntable." (R. 1575-6.) The responsibility for the accident was placed directly on Hostler Wyatt. (R. 1577.) Evidently this was a case of "man failure." But however it may be regarded it cannot be held to wipe out the facts established by the uncontradicted evidence above referred to. One exception proves the rule established by defendants' evidence showing many instances where engines without sufficient air pressure to operate the brakes have been controlled by using the hand lever for braking purposes. Wyatt confirmed this. The fact that he tried to reverse his engine shows he knew how the hand lever could be used to avert an accident. He said: "If I had been able to reverse it or could have gotten it on center I could have controlled it * * *." (R. 1359.)

The point is, and it is an established fact which cannot be denied, that when engines do move without sufficient air pressure to operate the air brakes, they may be, and usually are, controlled by use of the reverse gear as a substitute for the brakes, *if equipped with manually operated reverse gear. But if equipped with power reverse gear there is no chance of controlling them.*

It is further suggested the Commission's disregard of this evidence was warranted because the Shockley and Wallace cases occurred in 1916 and the hazard no longer exists. This situation is disproved by the evidence referred

to above showing these occurrences are still taking place notwithstanding the efforts of the carriers to avoid them. The human element of fallibility cannot be ignored in locomotive operation any more than in any other work with machinery.

The further suggestion that the valve gears could be blocked or fixed at a given point by a set-screw (in order to prevent the gears from "settling") can hardly be taken seriously. Canady's testimony, referred to in support of this, shows this is done when locomotives are undergoing valve setting repairs and testing. Such locomotives are "dead" and it is necessary to maintain the valves at a fixed point in order to test them. With manual reverse gear this can be done by simply latching the hand lever or wheel. But with power reverse gear it is necessary to block or "set" them. Of course the power reverse gear cannot be operated when this is done. The engine is out of service and necessarily cannot be placed in service until the blocks or set-screws are removed. (R. 1145-6.)

The Court was correct in finding the Commission's disregard of the undisputed evidence on this phase of the case was unwarranted and arbitrary. These facts unquestionably show that engines equipped with manual reverse gears under the circumstances shown are not nearly as apt to be productive of peril to life or limb as those equipped with power reverse gears. This had an important bearing upon the issue before the Commission and should have received its careful consideration.

FINDING 4 (d). In several serious accident cases steam connections auxiliary to power reverse gears have proven ineffective after air pressure has been lost; and in many emergencies there has been want of sufficient time to make use of the power reverse gear for braking purposes. Instances have occurred where pipe connections of power reverse gears were broken and the engine had become uncontrollable either by brakes or the reversing gear. Power reverse gears at times become inoperative through accidents to the auxiliary steam connections, such as freezing or destruction of packing within gear cylinders, in consequence of which some railroads have discontinued their use. (R. 220.)

We have mentioned under finding 4 (a) above four cases where engines with broken air pipes or connections got out of control and ran down mountain grades, attaining terrific speeds. Dalzell's engine was running light between two passenger trains. It gained speed rapidly and had nearly caught up with the train ahead when it hit a curve, was derailed, tore up the track, and rolled over. The fireman was killed and the engineer very severely injured but he regained consciousness quickly enough to warn and stop the train behind. Thus many serious injuries to the train crew and passengers were averted by sheer good fortune. Before the accident he noticed his locomotive was losing air pressure rapidly. He immediately set the brakes and reversed the engine with Ragonnet power reverse gear, the air pressure still being sufficient to accomplish these operations. The combined action of brakes and reverse gear brought the engine down to four miles per hour, whereupon (air pressure having "leaked" off) the reverse gear failed to hold the adjustment of the valve gear which moved by itself to forward motion and the engine lurched forward. (R. 1088-91.) The local inspector's report of this accident

to the chief inspector under the Boiler Inspection Act states:

> "It is likely that when all air pressure left the reverse-gear cylinder the link blocks dropped to the bottom of the links, although the reverse lever was still in back motion." (R. 1538.)

Dalzell stated he could have stopped the engine had it been equipped with a hand reverse gear. (R. 1091.)

Appellants do not question that Dalzell could have so controlled his locomotive but they do question that the engineers could have done so in the other three cases because the speed at the beginning was greater.

The engineers in these cases stated they could have stopped or controlled their locomotives at the speeds they were going, based upon their previous experience in using the hand lever for braking purposes. (Cooksey R. 817[22a]; Bailey R. 1103, 1105; Molte R. 1320-1.) Experiences of other engineers in successfully so doing which we have already referred to support their opinions. In each of these three cases control of the engine could not be obtained due to failure of the power reverse gear to function. Terrific smashups resulted, causing very serious personal injuries in two of the cases.

In another instance, Aita succeeded in getting steam into his power gear but it blew out the packing, the gear failed to function and his locomotive crashed into another train. (R. 702-3.)

The Commission said:

> "The matter of power reverse gears becoming inoperative while on the road, due to loss of air pressure, can be taken care of by properly applied and maintained steam connections." (R. 59.)

Appellants state the Commission was justified in disre-

22a. It is suggested hand brakes are used on some engines (Commission's Br., p. 78, Note 22). The evidence shows only hand brakes on tenders (R. 815-6) which "have very little effect on your engine." (R. 1322.)

garding this line of uncontradicted evidence upon the basis thus stated, and it is urged that these accidents would not have occurred had "properly applied and maintained" steam connections been on the locomotives. This assertion leaves entirely out of consideration two important elements which were present and will always be present in accidents of this kind. First, the time element. Appellants urge that the two steam valves[23] necessary to be opened in each of these cases were not located as close to the engineer's seat as they should have been. However, it must be realized that it would take a measurable length of time to open these valves no matter where located, and a very few seconds in an emergency of this kind may mean the difference between life and death. On cross-examination complainants showed by Molte: "If you lose your air I think it would take about 3 minutes to cut in the steam if the valves were where I could get to them handy and getting my steam to the reversing gear." (R. 1322.) Molte's testimony clearly shows that had his engine been equipped with a manual reverse gear he would have had sufficient time and space within which to control his train and averted the accident. He was about 2,500 feet from the cars with which his engine collided and he didn't attempt to use the auxiliary steam connection because he did not have time. (R. 1319.) Cooksey was two miles and a half from the point of collision when he discovered his predicament, but in the darkness and with steam and smoke blowing in his face the steam connection was of no use to him. He said: "The time was getting pretty short." (R. 817.)

Bailey apparently had more time than either of the others but he twisted off a cotter-key in endeavoring to

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23. Two valves are used in an effort to keep moisture out of the power reverse gear cylinder and connecting pipes as well as other air pipes so that they will not freeze up in cold weather; also to prevent seepage of moisture and steam destroying the effectiveness of the packing in the power reverse gear cylinder. (R. 1114-5, 1116, 1320, 817.)

operate the steam valves. (R. 1103-4.) This illustrates the second element present in all of these cases, namely, the natural excitement and agitation overtaking any man in such circumstances. These two elements, excitement and lack of time, as well illustrated in these four cases, demonstrate that the steam connections have been and are likely to continue to be ineffectual in many emergencies, as found by the court.[23a]

Furthermore, the appellants have overlooked those cases where the air pipe or connections have become broken somewhere near the power reverse gear cylinder. In such cases neither air nor steam can be conveyed to the power reverse gear and the gear can in no way be operated.[24] This is established by testimony of complainants' expert witness Zouck, chief engineer for a prominent power reverse gear manufacturer (R. 1381), confirmed by Hall (R. 1215), Jones (R. 923) and Burnett (R. 1114) and by evidence affirmatively showing numerous cases of such breakage.[25] It is therefore by no means certain that the auxiliary steam connections would have been effective in the Bailey, Cooksey, and Molte cases had there been time within which to cut them in. In any event, it is clear whenever breakage of the type described by Zouck occurs steam connections will be of no avail.

A reference to Exhibits 67 and 73 shows numerous cases

23a. Burnett: In such a case it (the steam connection) is frequently not effective because either engine cannot be reversed at all, or if reversed, it cannot be done quickly enough to avoid the possible accident. (R. 1116.)

24. Except the Precision gear, which can be moved by manual operation in such cases although much harder to move than the manual gear. (R. 1381.) This gear, normally, is considerably slower than hand reverse gear. (R. 1093, 1095, 750, 755, 1100, 1103.)

25. See cases marked (e), App. 64-9, particularly Rowe, 4 different instances; R. 783-4. Schaller; R. 796-7. Jones, 2 different occasions; R. 923-4. Bjorkholm; Ex. 67, 8 cases; R. 1547. Cartwright; Ex. 73, 9 instances; R. 1552-3. Knight, R. 722. Coyle; pipe broke on mountain grade. Engineer averted collision with another train by 7 feet. Could easily have controlled locomotive with hand reverse gear; R. 768. Outcalt; breakage of air supply pipe to operating reservoir of power reverse due to crystallization, vibration, etc.; R. 809. Harris, a number of cases; R. 821.

of other breakage of the power reverse gear mechanism making the gear wholly inoperative, in which event of course an auxiliary steam connection is of no use. (R. 1546-7, 1552-3.) Numerous other witnesses told of such instances.[26] Freezing of the reverse gear air cylinder and/or pipe connections, which is frequently caused by moisture seeping through the valve from the auxiliary steam connection, also renders the gear absolutely inoperative and frequently the air brakes are rendered inoperative by freezing at the same time.[27] This seepage renders power reverse gears inoperative in summer months as well. (R. 1116.) Also admission of steam to the power reverse cylinder impairs the packing therein, causing partial or complete loss of function and may affect the air-brake valve in the same way. (R. 1116, 534, 1236.) An instance is shown where the effort to operate the power reverse gear with steam resulted in the train brakes freezing and becoming inoperative, causing a train of 70 cars to run uncontrolled down a hill. (R. 776-7.) After experiencing these difficulties at least three important railroads have discontinued steam connections. (R. 534, 868, 766.)

The evidence to which we have referred fully supports finding 4 (d). The Commission could not have reached the conclusion expressed by it with respect to auxiliary steam connections had it given consideration to this uncontradicted evidence. It is clearly established that the mechanism of the power reverse gear is subject to a number of conditions which will render it inoperative, with consequent loss of control of the locomotive, and that auxiliary steam connections under many circumstances are ineffective to restore operation of the gear. It is equally well established

26. These cases also marked (e), App. 64-97, viz: R. 371, 521-3, 674, 722, 744, 751-2 (Precision gear tore itself off locomotive and fell to ground running at 55 m. p. h.), R. 821, 899.

27. Cases marked (d), App. 64-5, viz.: R. 456, 484, 505, 508, 562-3, 590-1, 604, 648, 673, 691-2 (ran into tank of another engine), 694, 698, 722, 776-7, 835-6, 841-2, 852, 857, 861, 862, 863, 868, 914-5, 918, 947.

that under the same circumstances the manually operated reverse gear remains available and effective to control the locomotive. These established facts very evidently received no thought or consideration by the Commission.

FINDING 4 (e): Serious injuries to employees have been caused by operation of gears of both types striking or catching a man of whose position of danger the operator was unaware. The engineer using hand reverse gear can more readily detect danger and prevent accidents of this character than one using power gear. The evidence discloses only minor injuries of this character on hand gear locomotives, but five deaths on those equipped with power gear. (R. 220.)

On pages 44-6 hereof we have mentioned the evidence to which this finding refers. That evidence shows without any dispute 22 very serious injuries, 5 of which resulted in death,[27a] all of which were caused by operation of power reverse gears, the injured man in each case being caught and crushed unintentionally and unknowingly by the operator of the gear. This evidence also shows, and it is all the evidence there is on the subject, that only two injuries, minor in character, have occurred in similar circumstances as the result of manual reverse gear operation. This much appellants do not deny. We submit that these facts constituted important and material evidence having a controlling bearing upon the issue, and that, regardless of the reason therefor, to which the Court referred, the Commission's disregard of this evidence was not consonant with its duty to hear and give legal effect to the relevant facts established before it.

Furthermore, the uncontradicted evidence establishes certain well defined reasons why these numerous serious in-

27a. Von Bergen referred to an additional death and 6 additional injuries on the Illinois Central. The above figures do not include these. (R. 1098.)

juries and deaths have occurred in the operation of power reverse gears but have not occurred in the operation of manual reverse gears. The reasons exist because of the essentially different characteristics of the two gears.

McGuire was standing within four feet of an engineer who was oiling his engine. He heard the engineer tell the fireman to put the gear into forward motion and he observed the tumbling-shaft lift-arm catch the engineer's head between itself and the driving spring, and as that happened the engineer hallooed. The fireman immediately moved the manual reverse lever back again, jumped off the engine, rushed to the engineer and remarked that he felt the obstruction, felt him when he caught his head. The fireman could not see the engineer on this occasion because he was under the running-board. His head was cut on the side that was shoved into the spring but not on the other side, due to the fact the lift-arm was smooth, whereas the spring was rough. McGuire, who saw the whole occurrence, had no reason to doubt what the fireman said with respect to feeling an obstruction. (R. 713-5.) Appellant Johnston's brief (23-4) contends this engineer "merely bumped his head on the end of the driving spring," but this was not McGuire's testimony.

In Canady's case (R. 1149) appellants do not question that he felt the obstruction, as the tinner's toes were being pinched between the reach-rod and the running-board. Canady's operation of a power reverse gear on another occasion, when he could feel no obstruction, crushed Nomato, squeezing him sidewise and breaking all of his ribs. He was so severely injured he did not regain consciousness and died the next day. (R. 1147-8.) In comparing the two accidents Canady said:

> "I don't think I could have hurt Nomato with a hand lever reverse because I could not have exerted over 100 or 150 pounds on it, but with the air reverse gear with an eight-inch cylinder on it, we were operating on

the house pressure of 95 to 100 pounds of house air. It was a dead engine. It would have approximately 4,000 or 5,000 pounds against the piston that were put against the job—I mean that much exerted right against the piston head. I was comparing that against the amount that would be exerted against the hand reverse lever." (R. 1149.)

The advantages of the hand reverse gear over the power reverse gear in circumstances of this kind are also shown by the testimony of several other witnesses.[28] There is no conflict in this testimony and it is not controverted in any way. The Commission gave no thought or consideration to the quicker starting and greater force of the power reverse gear movements. These elements obviously are important factors. They are beyond dispute. With an 8, 9 or 10 inch cylinder and pressure of 100 pounds per square inch (R. 538) on the power reverse piston, undeniably an overpowering force is exerted against a human being's body, head or arm in circumstances of this kind. The Commission brushed aside the undisputed testimony as to the

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28. *Von Bergen*, referring to Engineer Boggs' death (R. 550-2, 1181), said: "He probably would have escaped injury entirely. My basis for this opinion is that when a manual reverse gear is moved from any position the movement hesitates and is slow at its beginning on account of overcoming inertia of parts to be moved with muscular effort. This would have given Engineer Boggs sufficient warning to extricate his head from between the radius bar and main reservoir before it was clamped by radius bar. Whereas the power of the air pressure which actuates power reverse gear is so great the valve gear parts move with much greater force and at the beginning of movement with much greater speed than with manual reverse gear. * * * I base my opinion also upon the further fact that whereas our records I have previously referred to covering the past 10 years show eight cases of engineers being caught in valve gear on engines with power reverse gears, and injured, two of which resulted in death, there was not any such case on engines equipped with manual reverse gears. If Engineer Boggs had failed to extricate himself in time to avoid the radius bar catching his head, Crystal would undoubtedly have felt the obstruction with a manual reverse gear, and the manual power being much less than air power, Engineer Boggs would very likely have escaped with bruises instead of being killed." (R. 1182.)

Stearns said: "As to the difference in the action of the power and hand reverse gears: when you have a power reverse, if you set that valve, that piston is going to where that valve is to cut off. When the air takes effect in the cylinder she starts to move right away. I mean, as you set your valves or as the air takes hold she walks right back there like that [indicating]." (R. 1098.) See also Sawyers (R. 673), Burnett (R. 1110-11, 1128), Rasmussen (R. 634), Wisham (R. 1162), Carlson (R. 1137-8), Gallagher (R. 1164).

ability to detect an obstruction by simply saying "we do not think such a theory is sound." (R. 58-9.) As aptly stated in the Court's opinion, "There is something more than theory in this claim. If it is a fact there is potency in it on the question of comparative safety."

Appellants urge that the Court substituted its judgment for that of the Commision, and in fact weighed the evidence on this point instead of reviewing it to determine whether or not the Commission ignored it. Evidently they do not feel secure in this assertion, however, for they further urge that accidents of this kind may not be expected to occur in the future because of precautions shown to have been taken on the Union Pacific to prevent an occurrence similar to the Bunnell death. (R. 1101-2, 1111.)[29] This amounts to a position that the proven more dangerous propensities of the power reverse gear were properly disregarded by the Commission on the belief that the human beings who operate them in the future will be less human—less likely to be careless—than those who have operated them in the past. Witness Burnett, Superintendent of Motive Power, Union Pacific R. R., cited by appellants, said with reference to the Bonnell death case: "We have provided a means of avoiding it, if some employee does not violate our own rules." (R. 1111.)

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29. It is also suggested that the evidence should be disregarded because the engineer moves 2,000 pounds when he moves the hand lever. (I. C. C. Br. 77.) As shown in our "Statement of the Case," only some of the smaller parts going to make up the total weight of about 1,700 pounds are lifted. The remaining parts are simply revolved or moved angularly on bearings. The whole thing is counterbalanced by a heavy spring or springs (R. 1295-8, 1118, 370, 831, 570-1, 283-9, 378-9, 828-9, 855-6, 859) and resistance to the shifting of the lever may therefore quickly be felt by the operator as the witnesses testified.

Appellant Johnston's brief, pp. 24-29, dwells upon the strength exerted in moving the manual reverse gear as testified by complainants' accident witnesses. These witnesses were testifying in the main about unusual conditions causing the lever to work hard and requiring exertion of more than the normal effort. Many complainants' witnesses indicated there is no difficulty and no unusual strength required in operating manual reverse gear under normal conditions. (Stone, R. 242, 266-7, 290, 294, 296, 305, 311, 337, 388, 390, 397, 401; App. 1-11.) This was confirmed by the testimony of numerous witnesses for defendants. (App. 11-23.)

Back of all this evidence stand the undeniable facts that no man has ever been killed or seriously injured in similar circumstances with the hand reverse gear, while five deaths and many serious injuries are shown to have been caused by the use of the power gear. The proof of the pudding is in the eating. As found by the Court, the Commission disregarded the established facts of the power reverse gear's propensities for causing serious injuries and deaths and the lack of any such propensities for causing either serious injury or death on the part of the hand reverse gear, upon intended movement of the gear.

FINDING 4 (f): As an engineer does not ordinarily reverse his locomotive while in motion, no danger is involved when he brings his head inside the cab to reverse at a standstill; the use of hand reverse gear does not substantially interfere with observation of signals or keeping a lookout. (R. 220.)

Eighteen witnesses who testified on complainants' behalf on this subject confined their testimony largely to switching service or when engaged in reversing engines with manually operated reverse gear. Their testimony is abstracted in App. 31-4.[30]

Only five of the above mentioned witnesses testified with respect to road operation. At the most this testimony indicated the engineer could not keep his eyes on the track ahead at the moment of hooking up or dropping down the reverse lever, but some admitted, either directly or by inference, that they could look ahead through the front window while doing this. (R. 242, 249, 337, 338, 386.) Since the choice of time to hook up or let down the lever rests with the engineer it is obvious that he need not do so at the precise time of approaching a highway crossing or a signal tower. (R. 1308-9, 1255.)

30. R. 242, 249, 253-4, 259, 264, 268, 274-5, 297, 314, 326, 330, 340, 353, 367, 378, 386, 411, 418-9.

While some of these witnesses testified that in switching it was impossible while reversing their engines for them, as engineers, to keep their eyes on the switchmen on the ground giving signals (R. 253, 378), it is an admitted fact that this operation of reversing the engine is performed while the engine is standing still. (R. 268, 1255.) It must also be admitted that it is not necessary for the engineer to keep his eyes on the members of the switching crew while reversing the engine, as he has ample opportunity after moving the reverse lever, to verify the signal before proceeding with the next movement. (R. 268-9.)

A number of complainants' witnesses, moreover, admitted that they could observe such signals both forward and backward while handling the manually operated reverse levers under these circumstances and they illustrated the position which they take in the cab in so doing. (R. 297, 326, 340, 418-9.) No injury has resulted because of any interference with observing of signals or keeping a lookout occasioned by operating the hand reverse lever.

Forty engineers and various mechanical officials testified on behalf of defendants on this subject. Their testimony is abstracted in App. 35-41.[31] It shows without contradiction that during their entire service they have never at any time experienced any difficulty from, or interference on account of, operating manually operated reverse gears with respect to observing signals or keeping a lookout; that they have had experience also with power reverse gears; and that there is no substantial difference as between the two types of gears in this respect.

As conceded by appellants, the record shows no injuries due to the alleged interference of the hand lever with ob-

31. R. 426-7, 447, 472, 483, 498, 516, 521, 542, 548, 553, 555, 557, 564, 575, 605, 635, 638, 659, 666, 668-9, 671, 675, 697, 700, 722, 725, 743, 776, 780, 795, 800-1, 802, 841, 853, 888, 898, 902, 906, 913-4, 917, 921, 927, 929, 934, 939, 1110, 1181, 1213, 1255, 1275, 1302, 1308, 1320, 1323.

servation of signals or keeping a lookout. Had complainants been able to learn of any such injury it would of course have been proven in this case. These facts, coupled with the admissions made on cross-examination of complainants' witnesses which we have referred to above, clearly indicate that, as found by the Court, "the use of hand reverse gear does not substantially interfere." To have held otherwise would clearly have been giving effect to the shadow rather than the substance. The Commission's report refers to complainants' contention but fails to find any such interference. This signifies that the Commission could find no basis for so finding.

FINDING 4 (g): The "creeping" or unintended movement of the reverse mechanism and valve gear which the Commission found causes no accidents, does cause many and serious accidents and injuries as well as destruction of property. The evidence shows that at least one death was so brought about and probably another, together with several severe injuries. This tendency to creep is peculiar to power reverse gears, and reasonable maintenance of the apparatus is not sufficient, as the Commission holds it is, to overcome it. The view of the Commission that proper maintenance will prevent "creeping" in the case of power reversed engines is equally applicable to manual reverse gears, especially to those instances where the lever latch jumps out of the quadrant notch due to wear of the parts. (R. 220.)

The Commission's statement that "the fault termed 'creeping' causes no accidents * * *" is contrary to the uncontradicted evidence. The accident resulting in serious injuries to and later death of Engineer Ross directly resulted from "creeping" of the power reverse gear on his locomotive and it could not have happened had the engine been equipped with a hand reverse gear. (R. 1316-

8, Ex. 101, R. 1567-9, App. 165-6.) Engineer Blowers lost four toes in an accident while he was endeavoring to adjust the power reverse gear on his locomotive so as to eliminate the "creeping" thereof. Had the engine been equipped with a manually operated reverse gear this accident would not have happened. (R. 637.) Dalzell's fireman was killed when air leakage caused his power reverse gear to "creep" into forward motion while running on a steep grade; control lost and engine turned over. (R. 1088-92; App. 151-2.) Engineer Brotherton suffered an injury, in which the nail was mashed off one finger and another finger mashed so that it had to be stitched because of the "creeping" and erratic performance of the power reverse gear on his engine. (R. 485.) As found by the Court, a number of other serious injuries were caused by "movement of the reversing mechanism as well as the valve gear without the operating lever in the cab having been adjusted, * * *."[32] Notable among these are the following: Henry, fractured skull, 17 months off duty, $10,000 settlement (R. 803-4, App. 148); Lieber, broken bones in arm and hand (R. 846, App. 149); Waldrip, machinist's arm broken (R. 1154, App. 157); Rector, machinist's hand mashed (R. 1156-7, App. 157-8). Several other cases are mentioned under finding 4 (a) on page 43 hereof. In addition to the accidents which caused these injuries numerous accidents are shown to have occurred where, because of the "creeping" of the power reverse gear while the engine was in motion, the engine reversed itself, causing breakage and damage to the locomotive[33]

32. This is "creeping" as defined by the Commission in its report. (R. 58.)

33. See cases marked (f) App. 70-97; R. 484-5, 523-4, 561, 644-5, 650, 651, 673-4, 745, 751-2, 796-7. Appellant Johnston in brief contends this trouble can be eliminated by simply dropping the lever down a few notches. He cites the statement of one engineer to that effect. (R. 1389-90.) This, however, falls far short of accounting for the difficulties set forth in the testimony referred to above. See, for example, R. 743-5, 674-5, 651.

and in some instances to the train. In several of these cases the engine reversed itself while being driven at high speed, in one case causing the entire engine and boiler to bounce up and down. (R. 745.) In another case the power reverse gear cylinder was torn off the locomotive, falling to the ground, at high speed. (R. 751-2.) Again, the gear crept so badly it caused the train to "surge" and pull a drawbar. (R. 651.) The gears involved in these accidents were of the latest type. These occurrences produce an obvious element of danger. (R. 650, 526.)

There is no question about the uncontradicted character of this evidence. It is said, however, in appellants' briefs that the Court's finding is incorrect because "creeping" relates only to occasions when the locomotive is running over the road. It will be seen, however, that the Court took the Commission's own definition of "creeping," (Op. 214-5)[34] and that the accidents referred to by the Court in this connection come squarely within that definition.

The finding that "creeping" is peculiar to the power reverse gear is not questioned by appellants. They do question, however, the Court's further finding that the Commission's thought of proper maintenance preventing "creeping" is equally applicable to preventing the hand reverse lever from jumping out of the quadrant notch due to wear of the parts. The argument is advanced that proper maintenance will not prevent improper performance of manual reverse gears but that it will prevent "creeping" of power reverse gears. The weakness of this argument is apparent on its face when one considers the simplicity of the hand reverse gear as compared to the complicated mechanism of the power reverse gear. More-

34. "Creeping" was defined by a witness as "Any undesired movement of the power reverse gear or parts affected thereby not controlled by the hand lever in the cab, whether the engine is moving or standing still." (R. 681.)

over, the undisputed evidence is directly opposed to appellants' argument. This evidence covers performance of power reverse gears of all kinds, including the very latest types put out by the several manufacturers. It also covers operations throughout practically the entire country. It shows "creeping," in all its variations,[35] has been and still is prevalent (App. 70-97, items marked (a), (b), and (c)); and that the carriers and the gear manufacturers have continually experimented and put forth an unusual amount of effort in trying to overcome "creeping" but have made little progress in so doing.[36] Repairs to the gears frequently eliminate "creeping" only temporarily; repeated repairs are often necessary to the same gear. (R. 492-3, 579-80, 880-2, 1169-70; Exs. 62-65, R. 1542-4, 710-11; Ex. 35, R. 1492-3.) Defendants' evidence regarding "creeping" and resulting loss of efficiency in locomotive operation is supported by complainants' evidence on these subjects, which includes not only engineer witnesses but representatives of the principal power reverse gear manufacturers. See App. 64-70. (Engineers: Stone, R. 249; Brown, R. 291; Austin, R. 323-4, 326; Williams, R. 330-1; Rudolph, R. 341-2; Rasmussen, R. 350; Adams, R. 354-5; Underwood, R. 360; Crum, R. 366-7; McHugh, R. 1325-8; Davis, R. 1331-2; Nelson, R. 1337; Miller, R. 1340; Meagher, R. 1342; McKeaney, R. 1344; Hartle, R. 1350; Acker, R. 1357; Boa, R. 1371, 1373-4; Erisman, R. 1374-5; Manufacturers:

35. See p. 9 hereof.

36. C. & N. W. Ry. (R. 710-11; Ex. 35, R. 1492-3); Wabash Ry. (R. 880-3, 1169-73; Ex. 60-5, R. 1542-4); A. T. & S. F. Ry. (R. 1143-7); Union Pac. R. R. (R. 1120-22; Ex. 56, R. 1500); C. M. St. P. & P. (R. 1193-5, 1197, 1199-1200; Ex. 66-7, R. 1544-6); D. & R. G. R. R. (R. 1235-8); Western Maryland (R. 1241-4); N. Y., N. H. & H. (R. 1252-4; Ex. 73, R. 1552-3, 1298-9); C. St. P. M. & O. (R. 1277-8); C. B. & Q. (R. 1285, 1287); Monongahela R. R. (R. 1291-4; Ex. 80-3, R. 1555-9); Great Northern (R. 1303); B. & O. (R. 1307); C. & N. W. Ry. (R. 1214-5); C. & E. I. (R. 743-7); Ill. Cent. R. R. (R. 1182-3, 1186); C. & N. W. (R. 650-1, 657-9, 662-3); C. & N. W. (R. 675-80); B. & O. (R. 529-534; Ex. 20-24, R. 1487-8). See evidence cited on p. 10 hereof showing that in spite of intensive efforts of motive power officials and gear manufacturers little progress has been made in overcoming "creeping."

Zouck, R. 1376-8, 1378-80; Robinson, R. 1383-7; Mellor, R. 1387-8.)

On the other hand, the manual reverse gear being very simple in design and construction and long since passed the development stage (R. 1252), costs little to maintain and requires only very infrequent repairs as compared with the power reverse gear. (R. 1292-4; Ex. 82, R. 1556; R. 880-1, 883, 1282; R. 1120-1, Ex. 55-6; R. 1215; 710, 1194.) Improved materials and workmanship have greatly improved performance and ease of handling manually operated reverse gears in recent years. (R. 879-800, 1212, 1302.) The hand reverse gives a positive control of valve-gear adjustment. Creeping does not occur with hand gears. (R. 1309, 1252, 710, 1146.)

Finding 4 (g) was fully justified.

FINDING 4 (h): The great majority of injuries sustained on engines equipped with hand reverse gears were of minor character and resulted in temporary disability only, the large majority being trivial and causing only a few days' lost time. On the other hand, nine deaths are shown to have resulted from operation of locomotives equipped with power reverse gears, and a considerable number of permanent and serious personal injuries also so resulted. (R. 221.)

FINDING 4 (i): Oral evidence before the Commission showed approximately the same number of accidents causing personal injuries resulting from the use of each of the two types of gears. Documentary evidence consisting of form T accident reports for 1929 and 1930 showed 216 accidents from hand reverse gears and 16 from power reverse gears, but many accidents of the latter type were not included in these reports.

Injuries shown by oral testimony from hand reverse accidents caused permanent disability in two cases, the remaining being much less serious, though there were several hernias and cases of broken bones. At least 18 of these were the result of indiscretions or neglect on the part of the operator, or failure in maintenance and inspection of the gears. On the other hand, nine deaths resulted from accidents due to power reverse gears, and several permanent injuries, fractured skull with seventeen months' lay-off and an award of $10,000, amputated arm, and eight other cases of injuries very severe in comparison with those occurring on hand-controlled apparatus. The 216 injuries shown on form T reports, in connection with hand gears, were minor and in no case involved permanent disability. In only three of them was the injured person off duty more than 60 days, and over two-thirds resulted in from 4 to 15 days' lost time.

In considering the comparative number of accidents shown by the record in connection with the two types of gears the Commission gave no effective consideration to the comparatively more serious character of injuries, deaths, and property damage resulting from the use of power-equipped locomotives. On the contrary, it based its fact finding by counting or tallying the injuries attributable to hand-operated gears, on the one hand, and to power gears, on the other; in effect giving the same consideration to a slight or temporary injury as to a serious or permanent one, when comparing the merits as to the safety of the devices. See Automatic Fire Door Case, 151 I. C. C. 448, 464, *where the Commission approves the statement. It does "not matter how many minor injuries you have, you could not have enough of them to counterbalance one death."* (R. 221.)

Ready reference to all of complainants oral evidence regarding accidents may be had by referring to pages 42 to 60, inclusive, of the Appendix. We find therein shown 51 separate injuries which may properly be classified as follows:

Hernias	12
Broken bones	10
Strains	6
Torn ligaments	4
Bruises	4
Foot bruised or pinched	3
Sprains	2
Skinned and cut	2
Scalded about face and back, hurt when jumping	3
Cut on right side of head and right knee, both arms broken and left leg broken	1
Temporary paralysis of vocal cords	1
Slipped vertebrae	1
Blood clot on knee	1
Mashed finger	1
[37]	51

In addition to this oral testimony, complainants introduced 231 copies of accident reports filed by the Commission's Bureau of Statistics under the classification "Reverse levers, operating." (Ex. 13, R. 1420-86.) No efforts were made by complainants to present the facts through witnesses, and therefore, there was no opportunity for cross-examination by defendants. For the purposes of this case the facts disclosed on these reports are very incomplete, unsatisfactory and inconclusive. Several of the reports show on their face that the functioning of the hand reverse gear had little or nothing to do with the injury. In two cases the throttle flew open, striking engineer. (J. Gordan, R. 1425, and Joseph W. Horn, R. 1432.) In one case the engineman bumped his thumb on the reverse lever.

37. This classification was used in briefs before the Commission and in the District Court and has not been questioned by appellants.

(O. Stoneking, R. 1434.) In another case the fireman was "throwing the reverse gear" and caught his thumb in the back curtain. (W. Humphrey, R. 1435.) In still another case engineer was thrown against the *brake valve* by the impact when coupling the train. (George Williams, R. 1437.)

A classification of these various Form T Reports included in Exhibit 13 (R. 1420-86) shows the following:

A-1 Strained muscles, hernias, bruises, etc. Assigned cause—hard working reverse lever	27
A-2 Strained muscles, hernias, bruises, etc., due to engineer placing self in awkward position when operating reverse lever or slipping	32
A-3 Strained muscles, hernias, bruises, etc. No definite assigned cause	39
B, Injuries due to placing part of person in position to be injured	33
C, Injuries caused primarily by broken or defective parts of locomotive other than manually operated reverse gears	9
D, Striking elbows, arms, etc., against cab or other parts of locomotive	19
E, Injuries due to slipping and falling	4
F, Injuries due to defective condition of reverse lever or insufficient clearance between reverse lever and some other part of locomotive	6
G, Cases in no way connected with the use or functioning of the hand reverse mechanism	6
H, Injuries due to catching part of body between reverse lever and cab	10
I, Injuries due to operation of hand screw reverse gear	3
J, Cases previously covered by testimony of complainants' witnesses	8
K, Cases covered by testimony of respondents' witnesses	1
L, Injuries where power reverse gear was involved	11
M, Miscellaneous	23
[38]	231

38. This classification was likewise used before the Commission and the District Court and has not been questioned. (R. 108.)

By far the greater part of these injuries were strains and bruises. All were minor injuries involving no permanent disability, with one exception. In that case four toes were amputated causing permanent disability, and the engine was equipped with Alco, Type E, Power Reverse Gears. (Blowers' accident, R. 1430.) Out of the 231 accident reports included in this exhibit, only 8 show disability in excess of 60 days. Six of these occurred on engines equipped with hand reverse gears and two with power reverse gears. The facts, so far as shown by these Form T Reports, were as follows:

In the 6 Hand Reverse Gear cases.

O'Halloran: Engineer strained his back while operating reverse lever; 84 days probable disability. (R. 1426.)

Lynch: Left wrist broken; 90 days probable disability. (R. 1461.)

Brown: Fracture of ulna and radius; 61 days probable disability. *This man testified orally for complainants; his case is included therefore within the previous classification as well.* (R. 1462.)

Hickey: Hernia; 70 days probable disability (R. 1462.)

Moseley: Potts fracture; 90 days probable disability. (Evidently placed foot on boiler-head in front of lever.) (R. 1430.)

Alford: Compound fracture of leg; 90 days. Caused by draw bar falling out of car and catching link on engine. (R. 1486.)[39]

In the 2 Power Reverse cases.

Blowers: 4 toes amputated, *permanent injury.* Alco Power Reverse Gear. (R. 1430.)

Ryan: Wrist fractured; 61 days. Franklin Precision

39. Before the Commission and in the District Court appellees used this and similar statements, showing, however, only 3 hand reverse accidents involving disability in excess of 90 days. (R. 108-9.) The incorrectness of this was first brought to our attention by appellant Johnston's brief in this Court. A careful rechecking produces the above statement agreeing with appellants' brief.

Type F Power Reverse Gear gave a quick and unexpected turn of reverse wheel. (R. 1461.)

The 10 other power reverse gear accidents included in Exhibit 13 are shown in our table on page 39 hereof.

However, these did not constitute all power reverse injuries occurring in 1929 and 1930, as only those received by men in the cab are filed under the Commission's classification—"Reverse gears, operating," and many power gear accidents are filed under other classifications. (R. 1108; Ex. 13, R. 1420.)

Upon carefully classifying all of the injuries shown on the 231 Form T reports we find:

	Length of Disability	Actual	Probable*	Total
Number of Cases:	1 to 3 days.....	1	1	2
" " "	4 to 15 days.....	105	27	132
" " "	16 to 30 days.....	19	37	56
" " "	31 to 60 days.....	6	23	29
" " "	Over 60 days.....	0	8	8
" " "	Not stated	0	0	4
	Total.....	131	96	231

* 24 cases included in this column do not show whether actual or probable.

The attack made upon findings 4 (h) and 4 (i) with respect to the hand reverse gear injuries consists of correction of the number of cases in excess of 60 days, which we have noted above, and an attempt to exaggerate the seriousness of those very few hand reverse gear injuries which were serious. (Johnston's Br., pp. 54-5, 88-90.) It is pointed out that Engineers Adams, Brown, and Kinnaird suffered actual disability in excess of the estimated probable disability shown on the Form T reports. It is correct that Adams and Brown each lost considerably more time than was estimated. Kinnaird lost only two days more. (R. 386-7, 1456.) Six other engineers testified whose periods of disability were also shown on the Form T reports, in some cases being slightly overstated and in others slightly

understated.[40] The estimates were as accurate as could possibly have been made and do not impeach complainants' own Exhibit 13, as contended. The minor character of nearly all injuries attributed by appellants to hand reverse gear operation remains a fact indisputably established.

Appellants dwell upon the hard handling and erratic performance of the hand reverse gear under certain circumstances and upon what they please to term the "severity of the type of injuries sustained in handling manual gear." (Johnston's Br., 88-100.) They cite the 8 most serious of the hand reverse cases (pp. 89-90) shown of record and these may well be taken to be the most serious injuries which have occurred in connection with hand reverse gear operation. In only two of these cases did permanent disability result. Engineer Lowe suffered a permanent impairment in use of his left arm, causing him to leave engine service and go to farming. Since 1929 he has been operating an 80-acre farm, performing all the duties himself except threshing. (R. 383.)[41] Engineer Small's broken leg caused him to retire from engine service, he being aged 70 at the time of the accident. (R. 315.)[42] The remaining six were not as serious as many of the power reverse injuries and there were no deaths with hand reverse.

Appellants argue that in many of these cases testified to by their witnesses the injury was received without any

40. Barton, released (for duty) after 10 days; off duty 15 days (R. 376); *Form T reported* 11 *days* (R. 1470). Speas, stated 52 days (R. 270); *Form T reported* 45 *days*. (R. 1472.) Stringer, stated about 6 days (R. 348); *Form T reported* 7 *days*. (R. 1431.) Rogers, stated 9 days (R. 370); *Form T reported* 10 *days*. (R. 1427.) Young, stated 25 days (R. 413); *Form T reported* 6 *weeks*. (R. 1450.) Brandt, stated 32 days (R. 416-7); *Form T reported* 32 *days*. (R. 1437.)

41. A 60 per cent defective weld in the reverse level contributed to cause this accident. (R. 1415.)

42. Accident caused by breaking of main driving axle. Contributory defects found were an old flaw in the main driving axle covering approximately 60 per cent of the cross-sectional area. (R. 1411.)

negligence on their part or the part of anyone else.[43] If this were true in every case it would not change the character of the injuries. The facts would still remain firmly established that injuries to men in the cab attributed by appellants to the hand reverse gear have not involved loss of life nor loss of limb; and in only a very few cases have involved breakage or impairment of limb. The legal effect of these undisputed facts in comparison with the much more serious consequences attending the use of the power reverse gear was found by the Court to have been overlooked and disregarded by the Commission, and it is apparent on the face of the Commission's order that this is so.

Appellants do not question the Court's finding of facts regarding the power reverse gear injuries of record. They simply take the position that the Commission was warranted in disregarding that evidence because, as they say, the accidents causing those injuries are "not attributable

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43. The court in its opinion stated "It is surprising how many casualties in cases of hand equipped locomotives flowed from carelessness of position of the operator, carelessness of operation, neglect of proper general maintenance, worn quadrants, and faulty inspection after shopping. At least eighteen instances are in evidence in which such indiscretions or neglect were the underlying factor." (R. 211.) This is conservative as shown by the evidence. Stone: "There was nobody to blame for this accident, which would have been avoided if I had properly inserted reverse lever latch in quadrant." (R. 811-12; Ex. 38, R. 1496.) *Other indiscretions or neglect of operators*: (R. 310, 334-5, 346, 350, 390-1, 398, 407-8, 270, 273, 1403-5, 291-2, 1407-8, 299-300, 1410, 355, 371-2, 414, 421, 313-4); *improper maintenance or shopping*: (R. 277, 332, 348, 1400-1, 1418, 1407, 1410, 263, 1420.) It may be noted in passing that a considerable number of cases relied on by complainants were hernia cases caused by the engineer's foot slipping in handling the lever or having placed himself in an improper position. It is common knowledge that hernias may be caused by any act of exertion even slight. For example, Larsen's hernia became strangulated when he stumbled and had a fit of coughing while leaving his boarding-house one year after the handling of the lever to which he attributed his rupture. (R. 346.)

Lack of lubrication (dry valves) and steam in the cylinders, involved in many of complainants cases may be easily counteracted and eliminated by the engineer before attempting to move the lever. (R. 245-6, 279, 395, 420, 107-8, 250-1.)

to the gear, and are of a different kind'' than those attributed by complainants to the manual gear.[44]

We have shown herein that 23 power reverse gear injuries occurred to men in the cab while operating the gear. These are clearly attributable to the power reverse gear in the same sense that accidents are attributed to the manual gear by complainants. As to the others, the evidence to which we have already referred in some detail, taken in connection with the undisputed physical facts of the power reverse gear's design and employment of air pressure in operation, demonstrates the fallacy of appellants' argument. Accidents involving engines crashing into roundhouse walls or turn-table pits causing deaths, as in Shockley's case, are directly attributable to the failure of the power reverse gear to function because of lack of air pressure. In somewhat similar instances, such as Wallace's case, when sufficient air pressure is not available to operate the power gear or for any reason, such as freezing or breakage, the gear is inoperative (due entirely to characteristics peculiar to the power gear and not possessed by the hand gear), deaths and serious injuries have resulted and may result because those occurrences are still taking place, as shown by ample testimony. These accidents must necessarily be attributed to the fact that these engines are equipped with power gears instead of hand gears. The witnesses in each instance testified these accidents could have been avoided had the engines been equipped with hand

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44. It is further argued that since some of the power reverse gear accidents occurred as early as 1916 the carriers evidently "exhausted" all the evidence of such injuries. However, complainants' testimony also went back as far as 1916 (Domini, R. 334) and 1919 (R. 334; Moore, R. 1361) and 1920 (Calame, R. 1393-4), the latter being one of the few serious injuries shown by complainants. It is true of both complainants' and defendants' evidence that most of the injuries shown occurred within a period of 6 years prior to the hearing. Examining the dates of power reverse gear accidents we find the greatest number, 10, occurred in 1928, 7 (including 2 deaths) occurred in 1929, 2 (including 1 death) occurred in 1930, and 5 occurred in 1931. The showing of power reverse accidents was, like complainants' oral evidence, only illustrative. On the other hand complainants' documentary evidence is all-inclusive for 1929 and 1930. (R. 422, 1420.)

gears. As to the numerous very serious injuries and 5 deaths caused by intended movement of power reverse gears, the witnesses were all of the opinion they would not have occurred had the engines been equipped with hand gears, and this is supported by the fact that the exhaustive investigation in this case developed not a single case of serious injury or death to a person under similar circumstances as the result of hand reverse gear operation. In the cases of runaway engines on mountain grades, the failure of the power reverse gears to function prevented their control and the witnesses all stated they could have controlled their engines under similar circumstances with hand gears. Much undisputed evidence as to engines having been so controlled with hand gears under similar circumstances supports this. (Finding 4 (b), pp. 50-1 hereof.) These accidents and the resulting death and serious injuries were therefore attributable to the power gear. The Ross death and other numerous injuries due to "creeping," or other erratic performance of power reverse gears, are attributable directly to the gear's faulty operation. A number of injuries also clearly attributable to the power reverse gear were received by men when endeavoring to repair air leaks or otherwise repair or restore normal operation of a gear, both on the road and in the shop.

The foregoing facts cannot be denied. Appellants' argument in the final analysis seems to be based on the thought that in a number of the power reverse gear accidents other things than the operation of the gear itself or its failure to operate contributed to bring about the result, such as employee negligence or defects in other parts of the locomotive. Exactly the same conditions were shown with respect to hand gear accidents, many of which were contributed to by negligent acts of the injured employees themselves or other employees or by defects in or defective maintenance of the gear itself or other parts of the loco-

motive. So far as attributability is concerned, the accidents shown in connection with power gears and hand gears are on an equal basis.

FINDING 4 (j): Power reverse gears were neither developed nor applied to promote safety. They have been preferred by the carriers because of restricted cab space in the more modern locomotives of enlarged boiler capacity. They take up little room in the cab and may be readily installed in such limited space, where it would be awkward if not impracticable to use the hand lever. Increased width of fire box and boiler head and increase of appliances for use by the enginemen are features of design increasingly present within recent years. The preference of the carriers for power reverse gears on their modern locomotives is due to these modern conditions, rather than to promote safety, and is no evidence of their insincerity in opposing complainants' demands. In several respects power reverse gears do not make for safety as much as does the hand reverse gear, although the locomotive equipped with either type of gear proper(ly) installed and maintained is in proper condition and safe to operate without unnecessary peril to life or limb. (R. 221)

The testimony supporting this finding is wholly uncontradicted. In recent years the increasing width of the fire box of modern locomotives has reduced the available space between the side of the fire box and the outside of the cab, and additional appliances on these modern locomotives have resulted in the necessity of an ever increasing number of parts and controls being applied to the back head of the boiler and placed within the cab within easy reach of the engineer. These conditions have reduced the available space within the cab to such an extent as to make it mechanically impracticable to specify manually operated

reverse gears in designing these modern locomotives and have made power reverse gears (because they take up less room in the cab) a necessary feature of the design thereof, since clearance limits outside of the locomotive would not permit of widening or lengthening the locomotive cab. (R. 1252, 1286-9, 1308, 1281-2, 1264-6, 1258, 1239-40, 1224, 1198, 1200, 1193-4, 1178-80, 1187-8, 1191, 1177, 1153-4, 1118-9, 1133, 921, 746, 723-4, 721-2, 616, 614, 610.)

That the power reverse gear has never been considered as a device to promote safety is affirmatively shown (R. 1190, 1259, 1214, 1222, 1060, 1117, 1118, 1184-5), and it has not been contended, even by the manufacturers of power reverse gears, that it would do so (R. 1214, 1276, 1376-82, 1382-7, 1387-8).

The Commission's brief herein concedes that: "Undoubtedly the increasing size of locomotives and their wider boilers was largely responsible for the devising of 'power reverse,' its installation and growing use." But the brief of the other appellants refers to the finding of the Court giving effect to this evidence as a "complete error" (p. 57) and submits an analysis of Exhibit 58 showing that in numerous instances carriers have locomotives of the same *weights on drivers,* some of which are equipped with power reverse and some with hand reverse gears.

Their entire argument is based upon the false premise that locomotives of the same weights on drivers must necessarily have the same width of fire-box. There is no evidence in the record to support such assumption. The contrary is proven in the specific instance of the Western Maryland, whose mechanical engineer testified:

> "the use of power reverse gears was restricted to Mallets until the increased size of locomotives with wide fireboxes made power-reverse gear a necessary feature of the design, to keep within clearance limits. (R. 1239)

• • • • •

"In fact, I do not know of any hand reverse that could be applied to our later engines on account of their extreme width. You will note by the list up to about 90 inches we used hand reverse, and after that we have a maximum there outside of cab, I think, of 11 feet. When you get beyond the 90 inches it does not allow much space between the fire box and the inside of the cab to apply such a contrivance as a hand reverse lever." (R. 1240)

Examining the list he referred to (R. 1239) we find 9 engines weighing 160,500 pounds on drivers have fire-boxes 15 inches wider than 5 engines weighing 164,700 pounds, and have the same width of fire-box as 20 engines weighing 217,500 pounds and 30 engines weighing 215,000 pounds. Again, 10 engines weighing 195,200 pounds have fire-boxes 6 inches wider than 20 engines weighing 217,500 pounds, and 16¼ inches wider than 6 engines weighing 206,000 pounds. The fire-box sizes of locomotives subject to the order are not shown in Exhibit 58 or elsewhere in the record. But there is little doubt that similar variations in design on the Delaware & Hudson locomotives account for the fact that out of 106 engines weighing 209,600 pounds one-half are equipped with manual gear and one-half with power gear (Johnston's Br., 58). In any event, this evidence establishes the absolute futility of endeavoring to gauge cab clearance conditions[45] by weights on drivers.

Appellants refer also to the Illinois Central, which railroad has 1,540 locomotives equipped with power reverse gears, only about 200 of which are of such design as would permit of practicable application of hand reverse (R. 1185). They argue that clearance conditions on all other railroads must be assumed to be similar to those on the Illinois Central and consequently all others should be required to apply power reverse gears. There is no shred of evidence to support the argument. The whole of the evidence shows a

45. Admitted by the Commission to be an important factor for consideration (R. 60).

great variety of locomotive designs and interior cab conditions.

Twice in its report the Commission referred to the fact that the carriers have voluntarily equipped approximately 29,000 locomotives with power reverse gears. In the first instance (R. 58) it did so at the beginning of the paragraph in which it indicated various reasons for disregarding the undisputed power reverse gear accident evidence submitted by the carriers. In the second intsance (R. 59) it did so in connection with its failure to attach any greater importance to the more serious and fatal power reverse gear injuries than to the less serious and minor hand reverse gear injuries—circumstances likewise indisputably established. It thus appears from the face of the report that the Commission was advancing the fact of the carriers' voluntary equipment of 29,000 locomotives as its reason for disregarding all of the carriers' evidence. The report seems to so state, as it says:

> "*Aside from the evidence of record* we cannot believe that the carriers would contemplate the continued use of over 29,000 steam locomotives with power reverse gear, and contemplate the application of power reverse gear on new locomotives, if those in charge of the construction and operation of locomotives actually and sincerely believed that power reverse gear is less safe or less efficient than hand operated reverse gear." (Italics ours.)

The District Court held "This observation convicts the Commission of a clear disregard of undisputed testimony, and of the use, to support its conclusions, of such testimony in violation of its true import" (R. 212). The undisputed testimony to which the Court referred need not be here reviewed as it has been liberally referred to throughout this brief, with one exception. We refer to the evidence conclusively showing that because of "creeping" and other erratic performance power reverse gears have been and still are far less efficient than hand gears. The fluctuating

adjustment of the valve gear with the power reverse as against a positive and fixed adjustment with the hand gear causes a materially greater consumption of fuel and water in the use of power reverse gears. This was proven beyond any question by numerous witnesses for the carriers (App. 115-126).[46] No witnesses for complainants controverted this testimony (App. 112-115). Some of them confirmed it.[47]

None of the motive power officials who testified on behalf of the carriers expressed the opinion that a locomotive equipped with a power reverse gear cannot be operated without unnecessary peril to life or limb. A number of them, however, did point out that several types of accidents have occurred in locomotive operation with power reverse gears which are not possible to occur in the operation of hand reverse gear equipped engines. They pointed out that in these respects and because of the more serious consequences resulting from power gear accidents the hand reverse gear has advantages over the power gear from a safety standpoint. Their testimony, confirmed by the undenied accident evidence of the railroads, proves beyond any question or doubt that safety of locomotive operation would in no way be promoted by installation of power reverse gears on existing equipment (App. 132-4, R. 1115, 1183-4, 1201, 1215-7, 1222, 1243-4, 1255, 1260, 1265, 1277-8, 1287-8, 1290).

The Commission further cited as justification for failing to give legal effect to the carriers' evidence the statement of these officials to the effect that the Commission should not require power reverse gears to be removed from existing locomotives and hand operated gears used in lieu there-

46. This evidence included specific tests: Rossiter (App. 120, R. 847-8) and Boh (App. 124-5, R. 1268), as well as much testimony of general supervisory officials and many locomotive engineers in active service.

47. Williams (App. 112, R. 331); Meagher (App. 113, R. 1342); Hartle (App. 114, R. 1351); Erisman (App. 114, R. 1375).

of (R. 59). This is of course but a further development of the previous thought. The testimony thus referred to shows clearly that the demands of modern transportation have brought about the development of the wide fire-box locomotive, and that as a practical matter manual gears could not be used on these engines.[48]

It seems clear the Court's characterization of the Commission's action is fully borne out.

FINDING 4 (l): The more modern locomotives with wide fire boxes and limited cab room are the types where the principal difficulty in the matter of clearances has been experienced, but upon these types power reverse gears have already been voluntarily applied by the carriers. Improper clearances on manual reverse gear locomotives may readily and inexpensively be made ample by changing the location of appurtenances in the cab so as to provide more room. Accidents attributable to insufficient clearances which appear to constitute the majority of accidents relied on by complainants, are preventable thereby. (R. 222)

This finding is considered ahead of finding 4 (k) because of its close relation to the evidence referred to in finding 4 (j) above. The testimony there referred to supports the first sentence of the finding. There is much testimony by

48. The testimony of the Chief Mechanical Superintendent, N. Y., N. H. & H. R. R., is illustrative of this: "If business recovered and I were buying modern power now, I would buy power reverse gears, because of the difficulties to design and install a hand reverse gear on modern power, and, further, the fact that I am interested in and expect that a power reverse that will be equally reliable to the hand reverse gear will eventually be developed. I would be compelled to, due to the design conditions. I could not get away from it. But I have also in mind the possibility—and we, as one railroad, consider power reverse, as well as other devices that have possibilities towards making more convenient operation for our crews or other employes, and we want to go along with it. By that I mean that the changes due to wider fire boxes, that is, the conditions which can be obtained by making the clearances closer, are sufficient to overcome any objectionable features that arise out of the power reverse gear." (R. 1258.) See also R. 1286-7, 1178-80, 1111-12, 1290.

witnesses on both sides in this case indicating that on the vast majority of engines now in service the clearances are sufficient and there is ample room in the cab for the engineer to safely and conveniently perform his duties. (R. 1212-3, 311-2, 1274-6, 1302, 1305-6, 1308-9, 430, 539-40, 547-8, 554-5, 564, 575, 588, 635, 640, 669, 695, 701, 729, 742 and many others.) The Commission made no attempt to enalyze and apply this testimony so as to determine whether or not its "line of demarcation" would compel installation of power reverse on engines where clearance requirements are already satisfactory.

The testimony further shows that where clearances have been found to be insufficient, these conditions have been, or may readily be, remedied by changing the location of air pipes or brake valves, installing stop blocks or pins and cutting out or rearranging back board (R. 1302, 1307, 742-3, 878-9, 1213, 340, 384, 419, 312).

It is argued, however, that the space in which the engineer must work is limited, at best, and he is therefore constantly in danger of being struck by the lever should it move unexpectedly because he cannot be expected to keep clear of the lever. A relatively large number of the hand reverse accidents cited by complainants occurred because the engineer had placed his foot, knee or arm in the path of the lever. The Commission evidently grounded its order very largely upon this class of accidents (R. 55-6). There are no mechanical reasons to prevent the placing of foot braces in such positions as the engineers might desire so they would no longer be tempted to place their foot on the boiler head directly in front of the lever when handling the lever from their seat (R. 742-3, 878-9). Many engines already have them. Their proper use would eliminate most leg and foot injuries, of the type shown by complainants. The feasibility of placing a metal guard alongside the lever so as to prevent the engineer from inadvertently sticking

his knee or leg over into the path of the lever is also established; cost $10 to $15 (R. 879, 300). Complainants' witnesses were apparently not in favor of such installations but their testimony does not prove impossibility or even impracticability (R. 258, 300). It is apparent that if the danger of a careless man being struck by the lever were thought to be of sufficient importance these men could be protected against their own carelessness by a suitably designed guard.

Complainants exhibited instructions issued by one railroad designed to eliminate this type of accident.[49]

FINDING 4 (k): Complainants' evidence before the Commission shows an average of one injury for each 25 years of active service, and but two of these were serious enough to permanently retire the engineer. 125 witnesses for defendants with an aggregate of 3,852 years of locomotive service suffered four minor injuries or an average of one for each 963 years of service. The 216 form T report injuries applied to 31,597 manually equipped engines during 1929 and 1930 show an average of one accident per year for approximately 300 locomotives. (R. 222)

The figures used and conclusions stated in this finding are not questioned, except that Appellant Johnston's brief (63-4) contends the Court should in its computation have given effect to the statement in the Commission's report (R. 59) that 16,282 locomotives were stored in serviceable condition or were awaiting repairs. These figures were

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49. Exhibit No. 106 is a bulletin of engineers, firemen, and hostlers of the C. & N. W. Ry. at Madison, Wis., dated March 13, 1930.

"Occasionally an engineer is injured by the reverse lever cutting his foot, due to carelessness of the engineman sitting with his foot in front of the reverse lever.

"This bulletin is issued with a view of cautioning all enginemen about injuries that have occurred on this account, and you are cautioned not to place your feet in a position where they can become injured by the reverse lever. Accidents of this kind are preventable and must be eliminated."

taken from the Commission's Annual Report of December 1, 1931 (not introduced in evidence). Figures for 1931 would not properly have any bearing on the Court's finding, which was based on the number of "Form T" accident reports for the years 1929 and 1930. It is of course common knowledge that the last mentioned years, particularly 1929, were "peak" years of railroad traffic, so the Court would seem fully justified in assuming that practically all manual geared engines were in service in those years.

FINDING 4 (m): The manually operated screw reverse gear occasioned fewer accidents than any other type, and no evidence is in the record tending to prove that such gear is unsuitable or unsafe. Approximately 1,550 locomotives are so equipped. The evidence shows only three minor accidents in connection therewith in 1929 and 1930. (R. 222)

This finding refers to Exhibits 13 and 49 (R. 1420-86, 1499), showing that out of 231 injury reports filed by the Commission's clerical staff in the Bureau of Statistics under its classification "Reverse Lever, Operating" only 3 covered accidents occurring with the manual screw reverse gear. Admittedly 12 of these 231 accidents occurred with power reverse equipment, leaving 219 involving the use of manual reverse gear. Appellants concede Exhibit 13 is all-inclusive as to manual reverse gear accidents for the 2-year period (R. 422). It is therefore apparent that during this period hand screw reverse gears accounted for only 1.3 per cent of all accidents occurring with manually operated reverse gears. The 1,950 hand screw locomotives in service on 134 railroads alone (Ex. 58) constituted more than 6 per cent of the total manually reversed engines in service. The accident frequency with hand screw gears was considerably less than with hand levers. Likewise its accident frequency was very low when compared with power gears.

Taking accidents to men in the cab, alone, there were 12 power reverse against 3 screw reverse accidents in years 1929 and 1930 (R. 1499; table p. 39, hereof). Moreover, these screw gear injuries were of decidedly minor character.[50]

Oral evidence of 3 injuries with manual screw gears is also included in the record. These injuries were a hernia, a strain and steam burns on the face—minor injuries when compared with the great majority of power reverse injuries. They involved no peril to life and no injury to limb (R. 267-8, 275-7, 277-8).

The dearth of manual screw accident testimony is accentuated by the fact that appellants have quoted practically all of it in full in their briefs (I. C. C. Br., 89-94; Johnston's Br., 68-70). The Court well said:

> "The evidence suggests that this sort of manual operation meets every objection offered by the complainants, as illustrated by their evidence touching the causes of almost every accident attributable to manually operated gears." (R. 213)

FINDING 4 (n): But three injuries are shown of record on locomotives equipped with obsolete types of power reverse gears. Many accidents occurred in connection with locomotives equipped with power gears of the latest type, which operate on the same general principle as the earlier types. (R. 222)

There were 4 instead of 3 injuries shown of record resulting from use of the Mellin gear, which is the one generally spoken of by the parties as obsolete (R. 456, 1247, 1447, 768). The last mentioned one caused no loss of time (R. 768), and for that reason undoubtedly the Court did not

50. Bollard, strain of right groin and upper right leg; engine just received from shop; 12 days actual disability (R. 1424). Printy, bumped hand on screw reverse dislocating second finger; 5 days actual disability (R. 1471). Jolley, reverse lever operated hard due to engine just out of shop; strain of back; 7 days actual disability (R. 1448).

class it as an "injury." It is not included in the total of 23 injuries to men in the cab caused by power reverse gears referred to in this brief. An injury occurred with the McCarrol gear in 1927. This is a screw type of gear, evidently much like the most recent type called Precision (R. 768). The accident and injury to Coyle in using this gear was on a parity with those occurring to Harris (R. 1315), Emsworth (R. 1316), Brumfield (R. 1560), Ryan (R. 749), Slosson (R. 757), McDaniel (R. 1469), and McDonald (R. 1462) with the Precision gear. (See tables page 39 hereof.)

The Court's finding is substantially correct and disposes of appellants' argument that the carriers' power reverse gear injury evidence was justifiably disregarded because occurring in the use of obsolete gears.

Appellants further suggest (Johnston's Br., 70-1) that certain accidents which occurred with the type A Ragonnet gear (R. 691-2, 1142) occurred with an obsolete gear, citing Zouck (R. 1376-7). Zouck's expert testimony, however, shows that the Ragonnet type A is still being produced by his company, and there is little difference between it and the later types. The evidence of the gear manufacturers (Zouck, R. 1376-82, Robinson, R. 1382-7, and Mellor, R. 1387-8) leaves no doubt that the gears which would have to be put on in response to the Commission's order would be substantially identical and perform in exactly the same manner as the ones now in use.

This is confirmed by evidence showing a continuation of the same difficulties with the current models that have occurred with their predecessors. (See Note 36, p. 74; particularly R. 881-3, 1542-4; 1193-5, 1199-1200, 1544-6; 743-7; 675-80, 710-11, 1492-3, 1214-5.)

FINDING 4 (o): Many of the most severe injuries to employees working outside the locomotives were due to eccentricities and trickiness of operation of power reverse gears caused by their intricacy, or temporary insufficiency of power available on the engine, the latter being a circumstance not always detectable. From these conditions dangers arise to passengers and the general public, and not only to the enginemen. (R. 222.)

The accident evidence hereinabove discussed fully justifies this finding. Such cases as Henry's fractured skull (R. 804), Ross' lost arm, partial paralysis and later death (R. 1316-8, 1567-9), Lieber's broken arm and hand (R. 846), the death of Dalzell's fireman (R. 1088-90), and the numerous mangling and fracturing injuries mentioned on pages 40, 43, 46-8 and 54-7, caused by the extremely forceful and unexpected self-action of power reverse gears, definitely characterizes them as eccentric and tricky in performance.

Referring to four such accidents, appellants argue these men should have known the power gears would "jump" and they were careless in placing themselves in a position to be hurt. If this were conceded [51] it would place these accidents on an equal basis with many hand reverse accidents relied upon by appellants. (Examples: Stone, R. 243; App. 42. Snoddy, R. 299-300; App. 51. Stringer, R. 348; App. 52. Young, R. 414; App. 53.) This argument admits the eccentricity of the power gear causing the valve gear and connected parts to "jump" when air is turned into the power reverse gear cylinder after having been shut off, or upon air pressure being pumped up after the engine has been out of service. Hand reverse gears do

51. The contrary appears definitely to be true as to Wilkins (R. 718-9) and as to the other three they were trying to restore the functions of their gears and it is not apparent they did so improperly. (R. 691, 1138-9, 1154-5.)

not perform in that manner. Unquestionably neither these nor the other accidents above referred to would have occurred had their locomotives been equipped with hand reverse gears.

Appellants reiterate (Johnston's Brief, 72) their arguments that tricky performance of power gears due to insufficiency of air pressure may not reasonably be expected to occur in the future. In addition to what we have said in our discussion of findings 4 (b) and 4 (c) herein, we point out that the Commission, although later in its report failing to give any legal effect to it from a safety standpoint, recognized that the conditions referred to are a feature of power reverse gear operation still continuing. (R. 56-7.)

It is further urged that where power reverse locomotives move in this manner they are usually standing in or about the round-house and danger to passengers and the general public is remote. The numerous cases mentioned in note 22 (p. 57, hereof) show that such instances are occurring with comparative frequency and the possibility of an uncontrollable power reverse engine moving away from the roundhouse wall or the turntable pit and out into the yard or onto a main track, thus endangering train crews and passengers, can scarcely be denied. Likewise, instances where the engine becomes uncontrollable due to freezing or breakage, occurring on the road with comparative frequency in recent years, show potentialities for passenger train and other main line accidents which do not exist when engines are equipped with manually operated gears. (See pp. 63-4 and Notes 25, 26 and 27.)

FINDING 4 (p): Both types of gears have been in use by the railroads for more than twenty years. And prior to the complaints no claim was made by complainants, carriers, or manufacturers of power reverse gears, that the substitution of power for the hand reverse gear would promote safety.

Considering the number of locomotives in operation, the possibility of accident through the use of hand reverse gear equipment is slight and the risk of serious injury thereby very remote. The use of this type of equipment is not attended with any unnecessary peril to life or limb.

The conclusion of the Commission that safety of employees and travelers on railroads requires steam locomotives to be equipped with power reverse gear is substantially unsupported by the evidence before it. (R. 223.)

The first power reverse gear was built in 1904 (R. 1305.) That they have been in general use for considerably more than twenty years is not questioned.

Rule No. 157 covering "reversing gear" was prepared by the Chief Inspector, agreed to by representatives of the railroad employees and of the carriers and was thereupon approved by the Commission in its order of October 11, 1915. It contained no provision requiring power reverse gears and it is evident that all concerned had no idea at that time that locomotives equipped with manual reverse gears could not be operated without unnecessary peril to life or limb. The idea cannot consistently be now advanced for the evidence shows without question great improvement in conditions affecting hand reverse gear operation since 1915 (R. 879-80, 1212, 1302, as to im-

proved maintenance; and p. 91 as to improvement in clearance conditions).[52]

The evidence further shows that until the time of filing this complaint no such contention was made against hand reverse gears nor that power gears should be substituted as a safety measure. (R. 1276, 1192, 1252, 1185; and references on p. 86, hereof.)

The foregoing facts are not denied but appellants refer to the testimony showing that certain employees have considered the power reverse gear as a "labor saving device" (R. 1230), arguing therefrom that the power reverse gear prevents excessive fatigue on the part of enginemen and promotes their convenience, and in that way may be said to have a relation to safety and would warrant the Commission in reaching the conclusion stated by it that safety of employees and travelers requires installation of such gears. In view of the power reverse accident evidence this argument can hardly command attention. It may be noted, however, that it is entirely without substance, as shown by testimony of witnesses on both sides of the case.[53]

It is further suggested that more reversing gear accidents have been investigated by the Bureau of Locomotive Inspection since 1915 than any other class of accidents,

52. The number of persons killed and injured in connection with steam locomotives declined from 784 in 1925 to 333 in 1930, a decrease of 58 per cent (I. C. C. Annual Report for 1931, p. 43). During the same period injuries (no deaths) filed under classification "Reverse Lever, Operating," decreased from 285 to 76, a decrease of 74 per cent. In comparison with all casualties to engineers and firemen alone the decline in reverse gear casualties is even more striking. (R. 1107; Ex. 53, R. 1499.)

53. In general see App. 24-31. Aside from any question of excessive fatigue, many employees do not consider it a labor saving device. For instances where engineers found hand reverse gear operation easier and therefore preferred those gears see Buell, age 67 (App. 26, R. 556-7); Thorp, age 69 (App. 27, R. 576); Tewksbury, age 46 (App. 28, R. 729); Slosson, age 59 (App. 28,; R. 755); Horan, age 47 (App. 29, R. 860); Spaulding, age 57 (App. 29, R. 913). Where power reverse was preferred as a labor saving device it was a matter of minor significance. Elderly engineers operating 198,500-pound engines with hand reverse could have had power reverse engines. (R. 430-1. 867, 871.) One of these men, 67 years old, weighing 140 pounds, stated he would not take an afternoon job finishing work as late as 9 P. M. for the sake of having a power reverse gear. (R. 1365-6.)

save two. (R. 1195, 1398.) The two classes showing a greater number, each, involve such simple instrumentalities as (1) grate shakers and (2) squirt hoses. The former is the familiar bar similar to but larger than the domestic grate shaker bar, and the other is a short piece of rubber hose used for squirting water upon the coal and washing off the locomotive deck. The chief inspector's recommendations for installation of power reverse gears for several years prior to 1928 are also referred to.[54] His reason for so recommending does not appear, but it is shown that he has not made such recommendations since 1928. (R. 1276.) Clearly, these innocuous considerations would furnish no substantial support for the Commission's order.

We have heretofore shown that the accident frequency in hand reverse gear operation is very small, and it appears from complainants' evidence, if taken alone and considered in an aspect most favorable to complainants' case, that serious injuries with that type of gear are exceedingly few. The use of this simple tool on locomotives is not shown to have produced any greater hazard than those commonly attendant upon the use of the most simple tools and machinery in all industries. When Congress used the expression "*unnecessary* peril to life or limb," recognition was given to the fact that accidents may always be expected to occur in connection with locomotive operation (as in the use of any machine or tool), and its enactment was directed at the prevention of serious injuries and deaths rather than the prevention of minor injuries shown by the complainants' evidence in this case to constitute the vast majority of those occurring in manual reverse gear operation. It may well be asserted that the complainants' evidence standing alone would not have supported the order. If any legal effect

whatever be given to defendants' evidence it clearly cannot stand.

In addition to disregarding the established facts in the particulars stated above, the Commission expressly refused (R. 55) to give any consideration to the opinions of a large number of engineers and motive power officials of long and varied experience to the effect that considering men and conditions outside as well as inside the cab the hand gear is safer than the power gear. (App. 127-135) The opinions of eight witnesses for complainants took into consideration only men stationed in the cab and do not contradict the opinions of defendants' witesses (App. 126-7)

The Commission's one expressed conclusion "that the safety of travelers and employes on railroads requires * * *," etc. (R. 60) not only fell short of that which would have been essential but was palpably contrary to and in disregard of the whole of the evidence.

54. He is authorized to make recommendations "for the betterment of the service" (45 U. S. C. § 31; Boiler Inspection Act, § 7).

FINDING 5: The report shows on its face that the Commission failed and refused to consider uncontradicted evidence submitted by the railroads of their precarious financial condition and the necessity of conserving their cash and credit to meet current operating expenses and fixed charges in order to continue to maintain and operate their properties with safety to their employees and the public. The Commission failed to give heed to the outstanding facts of the general depression and the inroads upon railroad revenues of motor and water competition; it failed to consider difficulties of financing under such circumstances and the cost of complying with the order, and expressly grounded its order upon expected future improvements and financial conditions not shown of record or true in fact. (R. 223.)

Recognition of the financial condition and needs of the carriers which was particularly and comprehensively within the knowledge of the Commission at the time of denying appellees' motion for rehearing and reargument in April, 1933, is found in its annual report for the year 1932 to which we have referred. In *General Rate Level Investigation, 1933*, 195 I. C. C. 5, after stating that 1932 and the first quarter of 1933 was the worst period experienced by the railroads "in many decades" and that over one-sixth of the total mileage was then in receivership, the Commission said:

> "The net railway operating income in 1932 was only $326,000,000 compared with $603,000,000 in the depression year of 1921 and with $1,252,000,000 in 1929. In 1932 carriers comprising nearly 74 per cent of the total mileage failed by $250,000,000 to earn enough to pay their fixed charges. The volume of both freight and passenger traffic in 1932 was only approximately 50 per cent of that in 1926. Even the very low earnings of the past 15 months were obtained only after *drastic reductions* of expenditures, including reductions since 1929 of nearly 38 *per cent in the number of employees,*

> nearly 12 per cent of the hours of work per employee, and 10 per cent or more in the basis of pay of employees, with *deferred maintenance* to the probable extent of approximately *$300,000,000* on the basis of 1932 traffic and approximately $600,000,000 on the basis of the average traffic of the years 1927-1931. The credit of the carriers has been such that it has been impossible in most cases for them to obtain funds for any purpose, *even for maintenance work,* from any source other than the Government. * * * With the present condition of their properties, even without any increase in traffic, respondents *will soon be forced to increase expenditures for maintenance,* and, if there is any sustained and material upturn in the volume of traffic, large sums will have to be expended to bring the properties into condition to handle such traffic." (P. 58.) (Italics ours.)

The Commission's annual reports for 1931 (p. 42-3) and 1932 (p. 70) show a progressive decrease in the number of accidents due to locomotive defects and in the percentage of locomotives inspected found defective. The former decreased from 1,348 in 1923 to 145 in 1932, and the latter decreased from 65 per cent in 1923 to 8 per cent in 1932. Commenting on the latter, the Commission said "Due to the drastic economies now being practiced by the carriers, with increased traffic, it will be more difficult to prevent an increase in this percentage." This situation was unmistakably brought to the Commission's attention in this case by the evidence to which we have referred in our statement (p. 13; see also R. 1212). It seems clear the Commission gave no consideration to the inevitable adverse effect upon safe and efficient locomotive maintenance and operation if more than $7,000,000 were to be used in applying power reverse gears instead of maintaining existing equipment; nor to the desperate straits and sore needs of the carriers financially. We respectfully refer to the opinion of the District Court as stating the correct conclusion on this subject. (R. 216-7.)

IV.

THE REQUIREMENT TO INSTALL STEAM CONNECTIONS TO POWER REVERSE GEARS ALREADY IN USE IS ARBITRARY, UNREASONABLE AND UNLAWFUL.

The complaint made no allegation and contained no prayer with respect to steam connections on power reverse gears. Appellants say they were included within the term "other devices" in the prayer or that they are an essential part of power reverse gears. They must, however, admit that there was nothing in the complaint charging lack of safety of existing power reverse gear equipment of locomotives—no complaint because they were not equipped with steam connections. No relief was prayed for respecting these existing power reverse gears or steam connections. (R. 26-7.) Nevertheless the Commission's order requires installations of steam connections to existing power reverse gear equipment. (R. 62.) Appellees have set out that the enforcement of the order in this respect would constitute a taking of property of the railroads without due process of law, in violation of the Fifth Amendment. (R. 21-2.) This ground was urged in the District Court but not considered because of that Court's disposition of the whole case. The point raised rests upon the fundamental right of a defendant to a hearing upon a definite charge or issue.

Appellants contend in effect that this point has been waived because appellees introduced certain evidence in the case having to do with steam connections. As has been seen, that evidence was produced to show the inefficiency and ineffectiveness of such connections to control runaway engines and in certain other circumstances. That a hearing was not had on the question as to whether or not all existing power reverse geared engines should be equipped

with steam connections is forcefully demonstrated by the fact that the Commission's order requires them on all locomotives, notwithstanding there are 2,990 Precision gears in service which the evidence shows, without contradiction, are designed for use without steam connections and can be operated by manual effort in case of absence or failure of air pressure. (R. 1377-8, 1380-1, 1189.) The Precision gear is slower in normal operation than other gears, hand or power (R. 750, 755, 1093, 1095, 1100, 1103, 1183) and it would take considerablly more effort and a longer time than normally to reverse it in the absence of air pressure. (R. 1380-1.) Notwithstanding this, there can be little doubt that it could be so operated in an emergency much more quickly than the two valves of a steam connection could be opened up and the gear placed in operation by steam power. (R. 1322.) It is apparent that the Commission did not consider the complete lack of necessity for steam connections on Precision gears.

The matter of the moisture and condensation occurring in power reverse gear and air brake connections causing ice to accumulate in the wintertime and rendering the reverse gears and brakes inoperative was also very apparently given no consideration. This further suggests that no hearing was had on the question as to whether or not existing power reversed engines should be equipped with steam connections. None of this evidence being contradicted, it is further suggested that if it can be held the requirements of due process have been met with respect to this issue, the order is clearly contrary to the undisputed evidence, both as regards all steam connections, and particularly as regards the requirement of installing them on Precision power reverse gears.

Conclusion.

Consideration of the very limited powers granted to the Commission in the Boiler Inspection Act must, we believe, necessarily lead to the affirmance of the decree below.

The obvious lack of findings essential to support the order seems to us clearly to render it void.

Upon viewing the evidence in its indisputable aspects, it becomes quickly apparent that the Commission approached the case with its eyes upon the men in the cab alone. It gave no legal effect to the proven hazards to employes outside of the cab, to passengers or others, attending power reverse gear use—matters shown without dispute and having an important, and, indeed, which should have had a controlling, bearing upon the Commission's decision of the issue before it. Further, no legal effect was given to the undeniably more serious character of power reverse injuries and deaths, to the remarkably low accident frequency of the manual screw gear, to the extraordinary decline in all injuries attributed to manual reverse gear operation within the six years preceding the hearing, nor to the relatively very small number of reverse gear injuries in comparison with all injuries to enginemen. (R. 1107; Ex. 53, R. 1499)

As remarked by the District Court, the issue of comparative safety of the two types of reverse gears was plainly "not exigent" (R. 217). This called for careful consideration of ability to finance power reverse gear installations and effect upon safe maintenance and operation, which was not given.

Lastly, without finding any hand reversed locomotives could not be operated "without unnecessary peril to life or limb," a line of demarcation was drawn based on locomotive weights—a factor having no discoverable relation

to either cab clearance conditions or the so-called "hard handling" of manual gears, those being the two things upon which complainants' whole case was based.

For these and the further reasons discussed above and in the District Court's opinion, that court's decree should be affirmed.

Respectfully submitted,

R. V. FLETCHER,
SIDNEY S. ALDERMAN,
JACOB ARONSON,
H. Z. MAXWELL,
CLARENCE A. MILLER,
ALFRED P. THOM, JR.,
NYE F. MOREHOUSE,
Attorneys for Appellees.

December 10, 1934.

PROVISIONS AS TO RULES AND REGULATIONS FOR INSPECTION OF LOCOMOTIVE BOILERS IN VARIOUS BILLS LEADING TO ENACTMENT OF LOCOMOTIVE BOILER INSPECTION ACT.

Bill	Provision as Stated in Bill
S. 236 H. R. 9786 H. R. 9965 H. R. 10889	"SEC. 3. That the Secretary of Commerce and Labor shall, in such manner and under such rules as may be prescribed by him, once in every three months, at least, cause a careful inspection of each boiler and the appurtenances thereof of each such locomotive used in moving such traffic. * * *" (H. R. 1974, p. 6; 44 Cong. Rec. 2127.)
S. 6702	"SEC. 3. That the Interstate Commerce Commission is hereby given power to require and compel obedience to the provisions of this section, and to make, alter, amend, and enforce all needful rules and regulations for testing boilers of locomotives and their appurtenances used by carriers subject to this act, and to secure compliance with this act; and all such carriers, their officers and employees, are hereby required to obey all the provisions of this section and such regulations and orders as may be made by said commission." (H. R. 1974, pp. 7-8; 45 Cong. Rec. 2243.)
H. R. 25924	"SEC. 5. That the inspector general shall prepare from time to time rules and regulations not inconsistent herewith for the inspection, testing, and repair of locomotive boilers, to be observed by the carriers subject to this act, which rules and regulations being approved by the Interstate Commerce Commission * * * shall be obligatory. * * *" (H. R. 1974, p. 12; 45 Cong. Rec. 6383.)
	"SEC. 5. That each carrier subject to this act shall file its rules and instructions for the inspection of locomotive boilers to the inspector general, and after hearing and approval by the Interstate Commerce Commission such rules

and instructions with such modifications as the commission requires, shall become obligatory upon such carrier: *Provided however,* That if any carrier subject to this act shall fail to file its rules and instructions the inspector general shall prepare rules and instructions not inconsistent herewith for the inspection of locomotive boilers, to be observed by such carriers; which rules and instructions, being approved by the Interstate Commerce Commission, and a copy thereof being served upon the president, general manager, or general superintendent of such carriers, shall be obligatory, and a violation thereof punished as hereinafter provided. The inspector general shall also make all needful rules, regulations, and instructions not inconsistent herewith for the conduct of his office and for the government of the district inspectors: *Provided however,* That all such rules and instructions shall be approved by the Interstate Commerce Commission before they take effect." (H. R. 1974, p. 14; 45 Cong. Rec. 8623.)

S. 6702 As First Amended June 21, 1910.

"SEC. 3. That it shall be the duty of every common carrier subject to the provisions of this act to make and observe rules and regulations providing for efficient inspection from time to time of the locomotive boilers and appurtenances thereof used by it in interstate or foreign commerce, and to file with the Interstate Commerce Commission within three months after the passage of this act a copy of such rules and regulations. And the Interstate Commerce Commission may, after hearing at any time, modify, change, and revise the rules and regulations filed with it by any common carrier, and in so doing may establish new rules and regulations for the inspection of locomotive boilers and appurtenances thereof as to any common carrier subject to the provisions of this act, which modified, changed, revised, and new rules and regulations shall be observed and followed by such common carrier from and after the date fixed by the Interstate Commerce Commission in its order establishing the

Mann Bill

same. Such common carrier may from time to time change the rules and regulations herein provided for, but such change shall not take effect and the new rules and regulations be in force until the same shall have been filed with and approved by the Interstate Commerce Commission. * * *" (H. R. 1974, pp. 15-16.)

S. 6702
As Reported
on Dec. 16,
1910.

"SEC. 5. That each carrier subject to this act shall file its rules and instructions for the inspection of locomotive boilers to the inspector general, and after hearing and approval by the Interstate Commerce Commission such rules and instructions, with such modifications as the commission requires, shall become obligatory upon such carrier: *Provided however,* That if any carrier subject to this act shall fail to file its rules and instructions the inspector general shall prepare rules and instructions not inconsistent herewith for the inspection of locomotive boilers, to be observed by such carriers; which rules and instructions, being approved by the Interstate Commerce Commission, and a copy thereof being served upon the president, general manager, or general superintendent of such carriers, shall be obligatory, and a violation thereof punished as hereinafter provided. The inspector general shall also make all needful rules, regulations, and instructions not inconsistent herewith for the conduct of his office for the government of the district inspectors and prescribing specifically the requirements under section two: *Provided however,* That all such rules and instructions shall be approved by the Interstate Commerce Commission before they take effect." (H. R. 1974, p. 22; 46 Cong. Rec. 340, 1329.)

"SEC. 5. That each carrier subject to this act shall file its rules and instructions for the inspection of locomotive boilers with the chief inspector within three months after the approval of this act, and after hearing and approval by the Interstate Commerce Commission, such rules and instructions, with such modifications as the commission requires shall become obligatory upon such carrier: *Provided however,* That if any carrier subject to this act shall fail to file its rules and instructions the chief inspector shall prepare rules and instructions not inconsistent herewith for the inspection of locomotive boilers, to be observed by such carrier, which rules and instructions, being approved by the Interstate Commerce Commission, and copy thereof being served upon the president, general manager, or general superintendent of such carrier, shall be obligatory, and a violation thereof punished as hereinafter provided: *Provided also,* That such common carrier may from time to time change the rules and regulations herein provided for, but such change shall not take effect and the new rules and regulations be in force until the same shall have been filed with and approved by the Interstate Commerce Commission. The chief inspector shall also make all needful rules, regulations, and instructions not inconsistent herewith for the conduct of his office and for the government of the district inspectors: *Provided however,* That all such rules and instructions shall be approved by the Interstate Commerce Commission before they take effect." (H. R. 1974, p. 24; 46 Cong. Rec. 1329, 728-31, 2070-4; 2066.)

S. 6702 As Passed by Senate January 10, 1911.
and
The Present Law.

Source of Data: House Report No. 1974, 61st Congress, 3d Session.

6

FILE COPY

Office Supreme
F I L
DEC 11

IN THE

Supreme Court of the United States

OCTOBER TERM, 1934.

No. 221

UNITED STATES OF AMERICA, ET ALS.,
Appellants,

vs.

THE BALTIMORE AND OHIO RAILROAD COMPANY,
ET ALS.,
Appellees.

APPENDIX TO APPELLEES' BRIEF.

R. V. FLETCHER,
SIDNEY S. ALDERMAN,
JACOB ARONSON,
H. Z. MAXWELL,
CLARENCE A. MILLER,
ALFRED P. THOM, JR.,
NYE F. MOREHOUSE,
Attorneys for Appellees.

THE GUNTHORP-WARREN PRINTING COMPANY, 219 WEST JACKSON, CHICAGO

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COMPLETE LIST OF WITNESSES
(Except as to Short Line Railroads)

I. COMPLAINANTS' WITNESSES IN CHIEF

*Indicates injury with Hand Reverse Gear
†Indicates injury with Power Reverse Gear

Name	Age	Occupation	Railroad	Years of Engine Service	Record	Abstract
*Adams, J. R.		Engineer	Wabash	24	352–357	8, 25, 33, 52, 65,101
*Austin, J. H.	52	Engineer	Sav. & Atlanta	29	320–327	6, 33, 52, 64, 100, 127
*Barton, E. L.	47	Engineer	Nor. Pacific	30	374–378	9, 34, 47
**Brandt, Nick W.		Engineer	C. & W. I.	16	414–421	11, 25, 34, 54, 102
*Brown, James		Engineer	N. Y. C.	38	289–293	5, 24, 50, 64
*Crum, J. M.	62	Engineer	C. B. & Q.	34	364–368	9, 34, 56, 65, 101
**Diller, Ray M.	51	Engineer	Penna.	30	271–273	3, 24, 49, 98
*Dixon, J. M.		Engineer	L. & N.	29	396–400	10, 47
**Domini, A. R.	45	Engineer	C. & N. W.	19	333–335	7, 24, 45
**Flood, Patrick	51	Engineer	N. Y. C.	29	293–295	5, 44, 99
*Gans, H. C.	52	Engineer	L. & N.	28	392–396	10, 48
*Garman, W. A.	54	Engineer	St. L. S. F.	29	361–364	9, 53, 101
*Ginder, Matthias	53	Engineer	Erie	34	276–280	4, 43, 98, 126
*Greenwood, W. A.	60	Engineer	D. & H.	45	258–263	2, 32, 43, 64, 97
Haire, Elmer T.	49	Engineer	Mich. Cent.	29	302–305	5, 99
*Howard, Owen	53	Engineer	B. & O.	32	316–320	6, 51, 100
**Hunt, M. J.	55	Engineer	D. & H.	19	251–258	32, 42, 97, 126
*Hurd, Frank		Engineer	Erie	30	274–276	3, 32, 55
**Inglett, Otto	57	Engineer	A. T. & S. F.	28	372–374	9, 46
*Irwin, C. B.	58	Engineer	Penna.	32	265–269	3, 32, 43
*Kinnaird, C. B.	64	Engineer	L. & N.	41	385–388	10, 34, 47, 102
*Larsen, L. J.	48	Engineer	C. & N. W.	27	343–347	7, 24, 45, 101
*Lawrence, W. T.	71	Engineer	Erie	40	280–284	4, 49, 98
*Lowe, Harry	43	(Former Engineer)	N. Y. C. & St. L.	19	380–385	54
*Paschall, Jake	33	Fireman	L. & N.	13	388–392	10, 47, 102
*Pearce, A. K.	41	Engineer	S. A. L.	20	310–313	6, 56, 64, 100, 126
**Pool, J. B.	58	Engineer	C. R. I. & P.	25	400–409	10, 48, 102
*Price, J. R.	55	Engineer	C. & O.	28	308–310	6, 24, 44, 100
*Rasmussen, A. C.		Engineer	C. & N. W.	21	349–352	8, 46, 65
*Rogers, J. J.		Engineer	C. B. & Q.	26	368–372 378–379	9, 53, 66
**Rudolph, A. R.		Engineer	C. & N. W.	28	335–343	7, 33, 45, 65, 101, 127
*Small, Frank	74	Engineer	Maine Cent.	56	315–316	55
*Snoddy, B. A.	53	Engineer	C. C. C. & St. L.	24	295–302	5, 24, 32, 51, 99
*Southard, W. B.	52	Engineer	Mich. Cent.	25	305–308	5, 51, 64, 99, 126
*Speas, F. E.	52	Engineer	Penna.		269–271	49
**Stakeman, J. L.	73	Engineer	C. & E. I.	50	313–315	33, 56, 100, 126

Name	Age	Occupation	Railroad	Years of Engine Service	Record	Abstract
*Stone, Frank	56	Engineer	C. & A.	30	237–251	2, 31, 42 64, 97
*Stringer, W. H.		Engineer	C. & N. W.	21	347–349	8, 25, 33, 52
*Stuckey, LeRoy	51	Engineer	Penna.	30	263–265	2, 32, 43, 126
*Tanner, Lincoln G.	49	Engineer	B. & M.	27	285–289	4, 24, 50, 98
*Underwood, B.	44	Fireman	Wabash	21	357–361	8, 25, 55, 65
*Walker, Earl	39	Engineer	C. R. I. & P.	18	409–413	10, 34, 48
**Williams, H. G.	55	Engineer	C. & N. W.	28	327–333	7, 33, 44, 65, 101, 112
*Young, C. P.	62	Engineer	Grt. Northern		413–414	53

Total number of Complainants' Witnesses in Chief—44.

II. COMPLAINANTS' WITNESSES IN REBUTTAL.

Name	Age	Occupation	Railroad	Years of Engine Service	Record	Abstract
Acker, R. L.		Engineer	N.Y.N.H.& H.	24	1355–1359	67, 114
Boa, Edward R.		Rd. Fore. of Eng.	N. Y. C.		1369–1374	67
*Calame, W. H.		Engineer	U. P.	19	1393–1394	60, 70, 115
*Cloud, Leo F.		Fireman	N. Y. C.	6	1391–1392	59
Davis, Ralph R.		Engineer	G. N.	34	1331–1333	66, 113
Erisman, E. W.		Engineer	Wabash	28	1374–1375	68, 114
Golson, L. P.		Engineer	N. Y. C.	11	1368–1369	67, 114
Harnish, John A.		Engineer	Penna.		1375–1376	
Hartle, D.		Engineer	B. & O.	24	1349–1354	67
Johnson, W. V.		Engineer	C. & N. W.	39	1390–1391	70, 114
Lindsay, D. L.		Engineer	L. & N.	29	1364–1365	
McCullough, Murray L.		Engineer	N. Y. C.	10	1367	67
McHugh, John H.		Engineer	G. N.	39	1324–1331	57, 67
McKeaney, James		Engineer	Reading	34	1342–1346	66, 113
Meagher, J. P.		Engineer	C. & E. I.	32	1341–1342	66, 113
Mellor, C. L.		V. Pres.	Barco Mfg. Co.		1387–1388	70
Middaugh, H. W.		Engineer	N. P.	41	1333–1336	113
Miller, John T.		Engineer	B. & O.	25	1340–1341	66
Moore, M. M.		Fireman	L. & N.	24	1361–1364	58
Parmenter, L. D.		Engineer	U. P.	26	1395–1398	
Robinson, G. P.		Sales Mgr. of rev. gears & stay bolts	Am. Loco. Co.		1382–1387	69
Schmoldt, E. A.		Engineer	C. & N. W.	25	1388–1390	
Seelman, A. J.		Engineer	C. B. & Q.	34	1346–1349	113
Way, John I.		Engineer	B. & O.	42	1338–1340	113
Whipple, Edw. J.		Engineer	N. Y. C.	15	1392–1393	
Wilson, S. M.		Engineer	N. P.	31	1336–1338	66
Wortsmith, J. E.		Engineer	Wabash	46	1365–1366	
***Wyatt, J. M.		Former Hostler	Penna.		1359–1361	57
Zouck, G. H.		Chf. Div. Engineer	Franklin R.S.Co.		1376–1382	68

Total number of Complainants' Rebuttal Witnesses—28.